

# CARACTION

THE WORLD'S BEST-SELLING RC CAR MAGAZINE

MEGA POWER!

5

FASTESt  
ENGINES

p. 112

TAKE  
CONTROL!  
RTR Radio  
Upgrade

TAMIYA  
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MINI MONSTER

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MAY 2004

# RADIO CONTROL car action

VOLUME 18 ■ NUMBER 5 ■ MAY 2004

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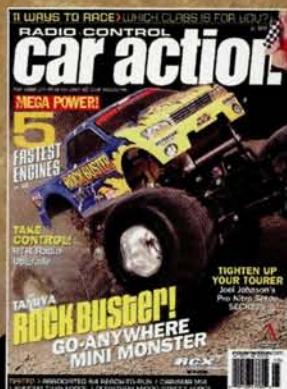
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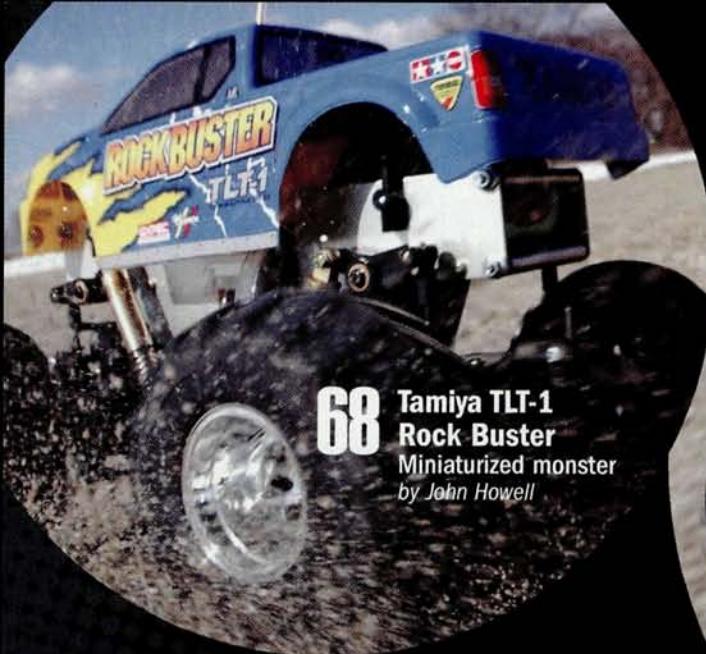
Cavalieri best in Buggy, and Associated trucks dominate

by George M. Gonzalez

radio control

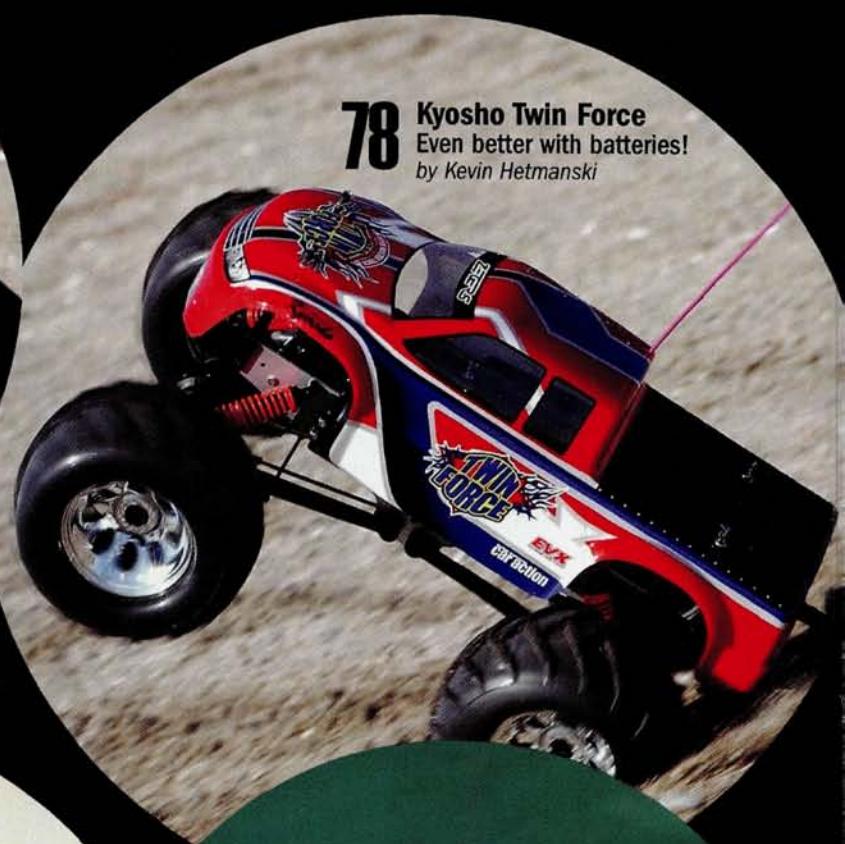


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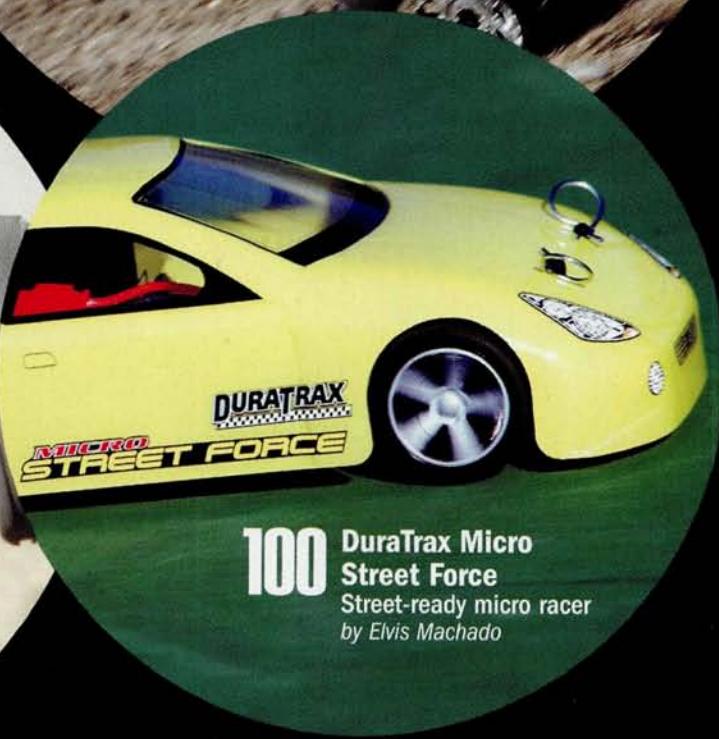
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## Race!

If you aren't racing yet, you should be, and with our "RC Racing Class Guide" in this very issue, now is the perfect time to start! Don't worry about how raceworthy your car or truck is or how well your driving skills will measure up. Just get out there and race! Or, at the very least, visit the track and turn some laps. Another case of perfect timing: there's a "Track Directory" in this issue. Just look up your state and find your local tracks. There are more listings online at [rccaraction.com](http://rccaraction.com), so you might even have two or three tracks in your area!

Why the big push to get you out on a real racecourse? Because it's the most fun you can have in RC. Even if you're just turning laps by yourself, track running is way more fun than bombing around in the wide-open spaces of a parking lot or backyard. Your 30mph car might seem slow as it crosses the enormous Mega Mart lot, but when it's on a racetrack straightaway headed for a tight hairpin, it will feel like 60mph. If you're running off-road, the speed sensation will be combined with plenty of hang time off RC-size jumps. If you think hopping curbs is cool, you'll be blown away by genuine dirt-track action.

When you take the next step and sign up to race, it gets even better. There's nothing more exciting than lining up for a pass or trying to hold off the guy who wants to pass you—or doing both at the same time! Even if you're running dead last, you'll still be racing against the clock and yourself. Can you turn more laps in the next heat than you did in the last one? That's the challenge that gets you to the winners' circle. And no matter how well you do on the track, you get to spend the whole day hanging out with guys who are as crazy for RC as you are—probably crazier. The funny thing is, even though you're racing against them, most of the guys will be glad to help you go faster! By the end of the day, you'll almost certainly be a better driver. You'll also be hooked on racing!

### IN THIS ISSUE

#### RC'S MOST POWERFUL ENGINES

When it comes to engines, everyone wants to know which is the most powerful. We tell you! Senior technical editor Steve Pond has all the dyno numbers on the highest-revving nitro burners in RC. No matter what you drive, you'll find the most potent powerplant for it here.

#### BATTERIES IN THE BED

We've got two big electric truck releases in this issue. First, our cover machine, the Tamiya TLT-1 Rockbuster. This mini-monster carries full-size radio gear and a standard 540 motor, it uses cantilevered aluminum oil shocks to support its solid axles, and it just might be the hottest Tamiya truck since the Clod Buster. From minis we go to the big stuff with Kyosho's Twin Force; it's an electrified Mad Force with dual 550 motors and a pair of battery packs on board! Awesome.

#### "HOW TO RACE PREP YOUR NITRO TOURER WITH JOEL JOHNSON"

Get ready for your best nitro season ever, with can't-miss performance and durability tips from none other than Joel Johnson. Yes, *the* Joel Johnson. He's our new guy!

Peter Vieira, Executive Editor

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# Shiny HOT STUFF



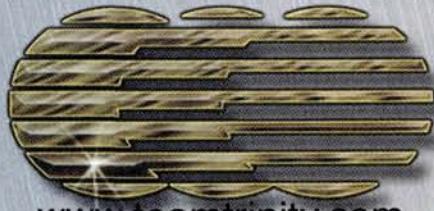
## No Brain'er Body Post Markers



No more struggling with a flash light trying to see where to mark your painted body to make the mounting holes.

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# readerswrite

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**WRITE TO US!** Send snail mail to "Letters," Air Age Inc., RC Car Action, 100 East Ridge, Ridgefield, CT 06877-4606 USA, or email [readerswrite@airage.com](mailto:readerswrite@airage.com). Letters may be edited for style and length. Sorry, we cannot reply to every one.

### LOSI LUST

Well, I was gonna get a Monster GT, but now I'll wait and see how that new Losi truck goes! Does it have a reverse mechanism? If it does, will there be a forward-only kit? As far as I'm concerned, they can just leave reverse off; I'm gonna race the wheels off that sucker. [email]

Bill West

Losi still won't tell us what's going on in that tranny, but you can bet there will be all kinds of racing stuff for that monster—including forward-only kits, if it indeed has reverse.

—Pete

### HOT AND COLD

In the February 2004 issue of *Radio Control Car Action*, a "Pit Tip" on page 60 says that you can cool an electric motor using cans of compressed air held upside-down. I warn you and your readers to not do this. The propellant used in most of these cans is highly flammable. The heat from the motor or even a spark from static electricity can ignite the propellant. I manage a hardware store that used to sell such propellants, and our local fire department asked us to voluntarily remove them from our shelves. They have had many fires attributed to the use of "canned air" products. Most of the cases were people using them to simply clean computers or keyboards and the product ignited from the discharge of static electricity. Please pass this warning on to your readers. [email]

Jamie Lupien

Well, we're all for preventing fires, so thanks for writing. I've seen racers do this for years and have done it many times myself (hey, motors get just as hot in the D-main as they do in the A!), but that doesn't mean it's safe. Readers, let's leave the canned-air on the shelves.

—Matt

[WWW.WEGOOFED.COM](http://WWW.WEGOOFED.COM)

Hi; I'm the webmaster for the Minnreg RC Club. First, thank you for the Worlds coverage



in your February issue. We really enjoyed hosting that event and also really enjoyed the article, but please be advised that there was an error in Minnreg's Web address. The correct address is: [minnregrc.com](http://minnregrc.com). [email]

Don Woods

Don, you and the rest of the Minnreg crew have my sincere apologies for that error. I hope people still hooked up with your site, as it truly is a good one. I must say, you guys also really put on a good show at the Worlds. Now everyone click over to [minnregrc.com](http://minnregrc.com)

—Matt

### XRAY SPECS

After reading the review of the XRAY M18 in the March 2004 issue, I found a couple

of errors. You mention that "an optional saddle-pack chassis allows you to mount the batteries in either 3+2 (5-cell) or 3+3 (6-cell) configurations, and it includes a special motor mount that positions the motor above the spur gear to make room for the batteries." The plans for this optional chassis never made it past the design-room floor. Although this option was unveiled with the M18 prototype at the Chicago Hobby Show, XRAY scrapped plans for this optional saddle-pack chassis and center motor mount. Also, the stock rear toe-in links are set for 3 degrees rear toe-in, not 2.5 degrees. [email]

Glenn Cauley  
Ottawa, Canada

The information on the optional saddle-pack chassis plates came directly from Serpent USA (XRAY's U.S. distributor). I called Serpent after reading your email



and was told that the saddle-pack chassis plates are still in the most current M18 optional-parts catalog. The optional chassis plates aren't in stock, but according to Serpent, there has been no word of the parts being

canceled. Who knows? Maybe XRAY found a better way to mount 6 cells on the chassis, but at this time, we have no information other than that provided in the article.

## readerswrite

According to the M18 catalog, the M18's rear toe is set at 2.5 degrees. I checked the toe angle on my car with an RPM camber gauge and found that it is approximately 2.8 degrees. (the gauge reads angles in 0.5-degree increments, so I couldn't get an exact measurement, but it wasn't quite 3 degrees). Thanks for your letter; I hope that you enjoyed the review.

—G-Man

### IT'S ALREADY LIFTED!

You know, every time I look for parts for my T-Maxx, I see the same aluminum or titanium parts everywhere. Sure, they look pretty, but they don't really add much to the performance at all. I have seen a few things that can turn the Maxx into a race machine, but besides big tires, I really haven't seen many parts that could turn it into an off-road beast. My Maxx already does pretty well, but why don't they make suspension lifts or something? I see lifted full-size rigs every day. How cool would it be to have a Maxx so high you could drive a touring car under it?

Try as I might, I cannot find a lift for it. If ya'll can help me out, that would be great; otherwise I'll have to design and build my own. Keep up the great mag. [email]  
Kade Watson  
Stephenville, TX

The T-Maxx is already lifted as high as practicality allows. You could crank up the shock preload to make the ride height sky-high, but that would be tough on the drive axles. The chassis is already on top of the gearboxes, so that's about as high as it can go. You could always cheat and get the lifted look by raising the body, but I can tell that you won't settle for anything less than pure daylight between the wheels and the ground. I won't underestimate your creativity, Kade; if anyone's going to find a way to lift a T-Maxx, it's you. And I bet you could sell a million lift kits!

—Pete

## YOU SAID IT

sponsored by

**TRINITY**

### "I can't find hop-ups for my truck"

I have a big problem. I have an XTM Baja Bullet, and I'm ready to upgrade its looks and performance, but I can't find any hop-ups, bodies, or anything of that sort for my truck. Is there anything from other trucks that would fit mine? [email]  
Jonathan Rios  
Los Angeles, CA

There may not be a ton of hop-ups labeled "For XTM Baja Bullet," but that doesn't mean you can't do a lot with it.

To change its look, get a clear replacement body from XTM and give it a custom paint job, or try fitting a shell designed for an Associated T3 or Losi Triple-XT. It won't line up perfectly, but I bet you can make it fit. Since the Bullet has 2.2-inch wheels, you could install a set of tires from Pro-Line, TRC Off-Road, Team Orion and others—anything from nastier knobbies to meaty monster treads.

A machine-wound modified motor is an easy speed booster; try a Trinity Speed Gems Pro or Orion Havok, and go with a 17-turn for a good blend of top speed and long run time. Aluminum shocks are also easy to add; DuraTrax gold shocks should work just fine. Take your truck to the shop, and the guys there can help you find parts that fit. That goes for any RC vehicle; there's always something out there to fit what you've got!

—Pete ■



Each month, "Readers Write" sponsor Team Trinity awards the "You said it" letter writer the Reference body of his choice. This is the Reference Nitro Racing Truck.

# MONSTER SIZE!



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## Monster Traction!



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TMT2004 Mini Monster T On-Road V Tread

TMT2005 Mini Monster T Street Slick

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[www.teamtrinity.com](http://www.teamtrinity.com)

Got a hot scoop? Send it to [johnh@airage.com](mailto:johnh@airage.com)!



BY JOHN HOWELL

# INSIDESCOOP

THE LATEST STUFF • SPY SHOTS • INSIDER INFO

The Mad Force gets even  
*Madder!*

## Kyosho Mad Force .21 Readyset

There's no doubt that Kyosho's Mad Force is now ready-to-run. A Futaba radio is included and installed, and Kyosho didn't skimp on the features; you still get the 3-speed, chain-drive transmission, powerful GX-21 engine with tuned pipe and manifold, oil-filled shocks, vented dual disc brakes with front one-way, and its solid-axle suspension setup. Sweet!

Kyosho; distributed by Great Planes Model Distributors  
(217) 398-6300; (800) 682-8948; [kyosho.com](http://kyosho.com).



## FAST FUEL

### Trinity Monster Brew



Trinity has new fuel that was designed with all monster trucks and RTR vehicles in mind, and it is the only fuel recommended by Sirio for the S18TX and S18TXPTR engines. It contains 16-percent oil and 20-percent nitro. According to Trinity, the oil improves your engine life by reducing the wear and tear on your expensive piston and sleeve. In addition, the fuel contains anti-rusting agents and anti-gumming agents to keep your engine super-clean.

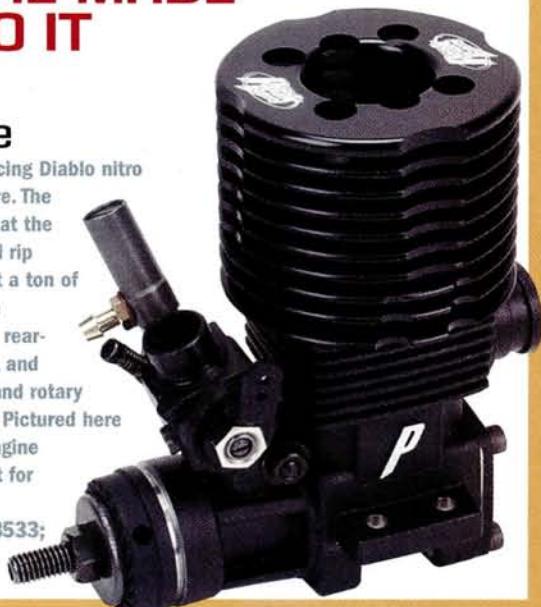
Trinity Products Inc.  
(732) 635-1600;  
[teamtrinity.com](http://teamtrinity.com).

## THE DEVIL MADE THEM DO IT

### Peak Racing Diablo Engine

The long-awaited Peak Racing Diablo nitro engine series is finally here. The Diablo engines are aimed at the club racer who wants good rip without having to shell out a ton of dough. The engines will be offered in various sizes, in rear- and side-exhaust versions, and they will come with slide and rotary carburetor configurations. Pictured here is the .12, rear-exhaust engine with a rotary carb—perfect for 1/10-scale gas trucks.

Peak Racing (714) 692-8533;  
[peakmotors.com](http://peakmotors.com).



## Mini Pleazer

### Pro-Line

### Crowd Pleazer Mini-T body

Pro-Line has a new Crowd Pleazer body for the Team Losi Mini-T. The little lid gets Pro-Line's unique Crowd Pleazer grill and headlights just like the 1/10-scale versions. It's made out of durable 0.030 Lexan, comes with a protective film cover and also includes a decal sheet, a window mask, a spoiler and mounting hardware. Pro-Line (909) 849-9781; [pro-lineracing.com](http://pro-lineracing.com).

## Power Racing Products

## HEX WRENCH SETS

These handsome hex wrenches are pleasing to the eye and easy on the wallet. Power Racing Products offers two sets of four wrenches in standard (0.050, 1/16, 5/64, 3/32 inch) and metric sizes (1.5, 2, 2.5, 3mm). The over-size, anodized handles are made of 7075 aluminum, and they have knurled and flattened edges that make them easy to grip. If a tip breaks, the wrenches' shafts can be removed easily and replaced. Power Racing Products also gives you a one-year warranty with their purchase.

Power Racing Products  
(408) 988-1188;  
powerracingrc.com.



## discharge done Right

Novak Electronics smart tray  
digital Equalizing Discharger &  
orange power cells

Novak's Smart Tray features a digital, microprocessor-controlled battery-discharge circuit that uses "Individual Cell Monitoring circuitry" -ICM for short—that accurately discharges and monitors each cell's voltage. Voltage cutoff is programmable and constantly displayed on a large, two-digit LED. Individual LEDs indicate each cell's discharge status, and the

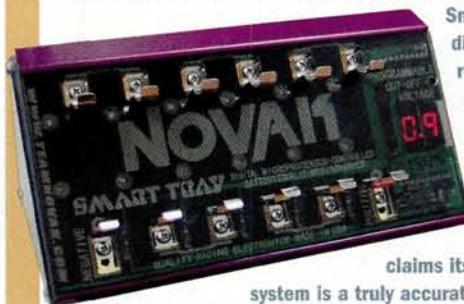
Smart Tray automatically stops discharging the cells as each reaches the programmed cutoff voltage.

You can use the tray with any brand of cell, but Novak is hoping you'll choose its new Accu-Match GP3300s. Novak

claims its proprietary Accu-Match

system is a truly accurate cell evaluation program with ultra-precise performance numbers. The cells are multi-cycled and treated with Novak's Voltage Enhancement Method (VEM). The packs will be available in two performance levels: Gold and Platinum.

Novak Electronics Inc. (949) 833-8873;  
teamnovak.com.



# Kanai edition

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42,000 rpm  
5 ports  
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16.65mm stroke  
turbo head**

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[www.teamtrinity.com](http://www.teamtrinity.com)



## Lightweight M8

### HT Batteries Lithium-polymer cells for the Airtronics M8

HT Batteries' 3-cell, lithium-polymer (Li-poly) battery trims nearly 6 ounces off your M8, compared with 8 standard AA cells—that's nearly half a pound less radio to hold during those long gas Mains! The cells come with a wall charger and last about three hours on a full charge. These powerful cells run the M8 in the high 12V range, which helps increase radio range. Many top pro's who run Airtronics M8s have switched to this setup.

HT Batteries (818) 266-8360; [htbatteries.com](http://htbatteries.com).

### MORE RIPPIN' NOVAROSSI'S

#### Novarossi Long- and short-stroke .21s

Novarossi's new long-stroke .21 is designed to have the power of an 8-port with the power band and fuel consumption of a 5-port. This engine also has an innovative dust seal between the head and case to keep dust away from where the sleeve and the head button seal.

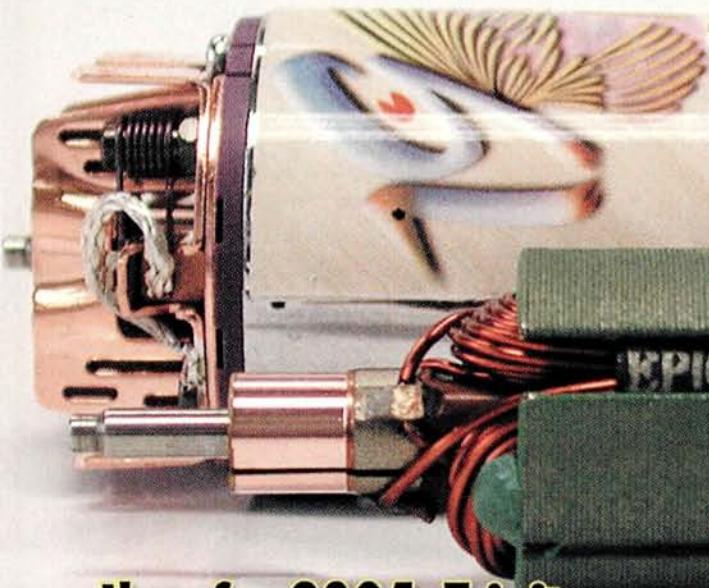
This engine features an 8-port ABC piston and sleeve, plastic slide carburetor, 9-fin head and a turbo plug head button.

Novarossi also has a short-stroke .21. It was designed to have a very linear powerband that allows your car to hook up coming out of the corners. This 5-port engine has an ABC piston and sleeve, a plastic slide carburetor, a 9-fin head and a normal plug head button. According to Novarossi, this engine is perfect for novices and experts because of its very "usable" powerband.

Novarossi; [Novarossi.it.com](http://Novarossi.it.com).



19 turn, 19awg, Locked Commutator  
 Adjustable Timing  
 (Endbell Marked for 0, 12, 24 & 36 Degrees)  
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 Meets All ROAR Specs For 19 Turn Modified Oval Class  
 TRI14004, Standard Version  
 TRI14005, Pro Version, Dyno Tuned & Tweaked



New for 2004, Trinity epoxy balanced 19 turn spec motor  
**If there is a drill hole, it's Illegal!**

# INSIDE SCOOP

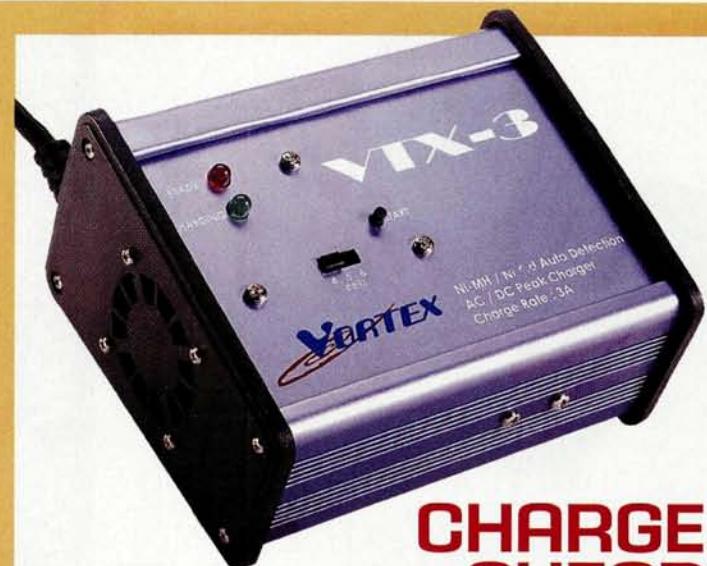


## KNUCKLE'S TI

### Lunsford Racing Tibanium for team LOSi BK2

Everyone knows that when it comes to building beefy Ti racing parts, Lunsford Racing has it covered. Lunsford now has new titanium performance components for the Losi BK2 buggy. On deck is a complete titanium screw set, plus standard Punisher and Super Duty turnbuckles.

Lunsford Racing (541) 928-0587;  
[lunsfordracing.com](http://lunsfordracing.com).



## CHARGE FOR CHEAP

### Vortex VTX-3 charger

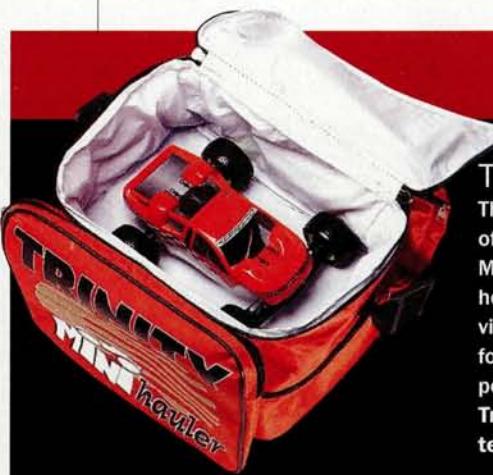
Vortex's new budget VTX-3 AC/DC charger is the perfect step up from an old-school dial charger. The VTX-3 is NiMH-compatible, will auto peak-charge 3000mAh batteries with its zero delta voltage technology, and you can select the number of cells you want to charge (4, 5 or 6). It has a constant setting of 3 amps while charging, uses advanced Fuzzy Logic peak detection and has an auto cutoff circuit with MOSFET technology. To help keep things cool, it also has a built-in turbo cooling fan.

Vortex; distributed by Magma Intl. (905) 886-1808; [magmarc.com](http://magmarc.com).

## T-BAG

### Trinity MINI-T carry bag

This sweet little four-compartment hauler bag is made of high-quality nylon and is designed to hold your Losi Mini-T and accessories. The bottom compartment holds the transmitter while the top holds the truck (or vice versa). The bag also has two side compartments for spare parts and a shoulder strap for easy transportation. The bag is currently available only in red. Trinity Products Inc. (732) 635-1600; [teamtrinity.com](http://teamtrinity.com).



## SUPER SERVO

### KO Propo Digital 8044 servo

What you see here is KO Propo's newest 1/5-scale "supersized" digital servo. This beast comes with a whopping 333 ounces of torque (damn!), dual ball-bearings and gold-plated metal connectors, and it weighs 5.02 ounces. Size-wise, the servo specs out at 2.35x1.15x2.09 inches.

KO Propo USA Inc.  
(310) 532-9355; [kopropo.co.uk](http://kopropo.co.uk)

### Team Associated Factory Team Monster GT chassis

Team Associated has a new, machined Monster GT chassis made out of a solid piece of aluminum. The lightweight chassis comes in the well-known Factory Team blue-anodized finish. Not only does the aluminum chassis look good, but it also happens to be 1.7 ounces lighter than the stocker!

Team Associated  
(714) 850-9342;  
[teamassociated.com](http://teamassociated.com).



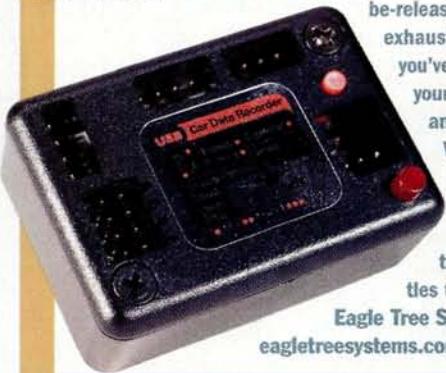
**FACTORY**  
*Featherweight*

## RC BLACK BOX

### Eagle Tree Systems RC car data recorder

Eagle Tree Systems' lightweight CDR (Car Data Recorder) constantly records your car's steering and throttle positions, rpm, speed, temperature and more. Optional expanders include a slip-on battery-pack voltage and current monitor, and soon-to-be-released expanders for dual-axis G-force and exhaust-gas temperature monitoring. When you've finished running, connect the unit to your PC or laptop with the included USB cable and download your car's data. The included Windows application CD-ROM then plays back your race and allows you to save it for later viewing. You can also use a spreadsheet program to create graphs of the data. This has enough bells and whistles to make most NASA engineers jealous!

Eagle Tree Systems (425) 614-0450; [eagletreesystems.com](http://eagletreesystems.com).



### Mighty mini cells

#### Trinity VIS Matched packs for micros

As popular as minis are today, it's a good thing that Trinity now offers zapped VIS packs. These matched micro packs are available in 5- and 6-cell configurations. The cells have been charged at 3 amps and discharged at 10 amps, and the voltage cutoff is set to 0.9 volt per cell. The cells come with battery bars and wire for assembly. According to Trinity, assembling a pack of these matched cells results in significant increases in punch and top speed.

Trinity Products Inc. (732) 635-1600; [teamtrinity.com](http://teamtrinity.com).



### BEEFY-T

#### APS Mini-T turnbuckles

APS' hardened stainless-steel turnbuckles for Losi's Mini-T provide extra strength and allow more precise camber and toe adjustments. The turnbuckles come six to a set, and a cool wrench is also available.

APS; distributed by Magma Intl. (905) 886-1808; [magmarc.com](http://magmarc.com).

### COMPETITION CHARGER



mAh and temperature settings) and an mAh auto cutoff. It also has five built-in fans to provide maximum cooling, but best of all, it can charge up to 36 cells at once! Now you can show up at the track really, really late and still make your first qualifier!

Futaba also has a trick, optional Thermo Stand that complements its CDR-5000. It checks each individual cell's temperature, mAh rating and voltage level, so modelers know precise battery status, and it plugs right into the side port of the CDR-5000 charger.

Futaba; distributed exclusively by Great Planes Model Distributors (217) 398-6300; (800) 682-8948; [futaba-rc.com](http://futaba-rc.com).

### Futaba CDR-5000 High-performance charger

Check this thing out! This charger is so feature-filled that we can't even scratch the surface here. Futaba has jumped into the pro-charger market with its new CDR-5000. Not only is it easy to program, but it also has such features as an auto cutoff (which can be programmed for delta peaking),

### "MY MINI-T TRACK" CONTEST

Team Losi is running a "My Mini-T Track" contest. It's open to all private and individual indoor and outdoor tracks; size doesn't matter (no commercial tracks allowed). Losi is just looking for creativity, good use of space, natural terrain, etc. The contest will run from March through August, and three finalists will be selected each month for special prize packages. In September, the top 10 winners will be selected from the monthly finalists, and the top five will win Mini-Ts. The Grand Prize winner will also receive a full assortment of performance parts. Those who place sixth through 10th can look forward to special performance parts packages. For full details, check out the Team Losi website for rules, entries and updates.

Team Losi; distributed by Horizon Hobby Inc. (800) 338-4639; [teamlosi.com](http://teamlosi.com); [horizonhobby.com](http://horizonhobby.com). ■

**Reader's Ride  
OF THE MONTH**

JULIO CARRERAS, PASSAIC, NJ

**TRAXXAS T-MAXX**

Julio's T-Maxx has spent as much time being customized on his workbench as it has ripping up his neighborhood. This Maxx is fully modified with parts from Hardcore Racing, Hitec, Motor Saver, RC Trix, Megatech, Team Associated, Pro-Line and Unlimited Engineering. The Ford Bronco body is from HPI.



RICK AGEE, MUSCLE SHOALS, AL

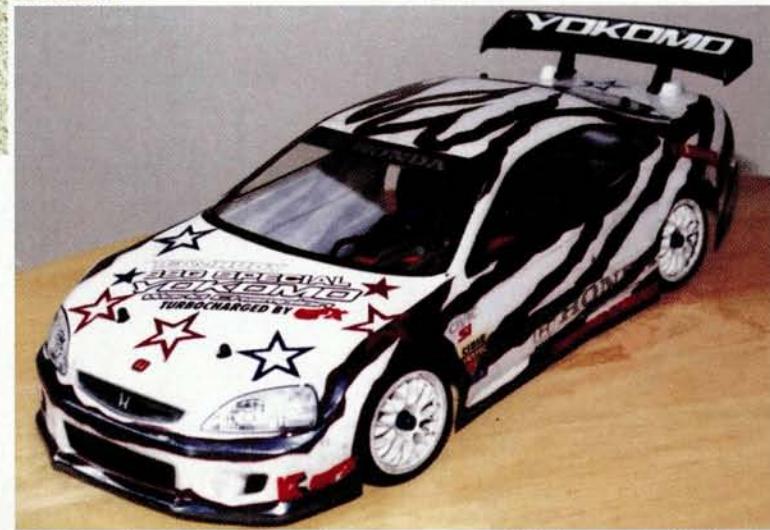
**TEAM ASSOCIATED RC10 T4**

An Associated T4 sits under the Pro-Line Crowd Pleaser body that was custom painted by Rick. Rick decided to go brushless with a Novak Super Sport system and also added a digital Hitec servo, titanium linkages, a Trinity front bulkhead and brace, RPM rod ends and a set of Progressive Suspension shocks. To keep his truck loaded with plenty of go power, Rick uses a 7-cell pack of 3300 NiMH batteries.

**WIN A ONE-YEAR SUBSCRIPTION TO RC CAR ACTION MAGAZINE!** Send a sharp, uncluttered, well-exposed color photo of your vehicle (no Polaroids) and a brief description to "Readers' Rides," *RC Car Action*, 100 East Ridge, Ridgefield, CT 06877-4606 USA. If we publish your photo, you'll receive a free, one-year subscription to *RC Car Action* and will be eligible to win the "Reader's Ride of the Year Contest." Write your address and phone number on your letter and on the back of every photo you send. If you'd like to send photos by email, submit your 300dpi TIFF or JPEG images to [readersrides@airage.com](mailto:readersrides@airage.com).

**AL MELVILLE, BELVIDERE, IL  
YOKOMO MR-4TC SD SSG**

Touring-car racing is going strong in Illinois, and Al is ready to rock with his Yokomo MR-4TC. A Novak GT7 ESC handles the juice coming from a Fusion battery pack and then sends it to a Trinity Monster stock motor. Al airbrushed the HPI Honda Civic body with a blend of Parma Faskolor paints.

**DUSTIN YAVASILE, VISALIA, CA  
HPI RS4 RALLY**

This RS4 Rally has been modified for on-road duties but can also easily be switched back to its Rally digs in a matter of minutes. A Futaba radio system controls the sedan with a Reedy MVP motor, and a Sanyo battery pack provides punch. Dustin picked up an HPI BMW body and used Hobby Tech rims wrapped with Pro-Line Road Rage tires to match the paint scheme.





JESSE RIVERA, LOS LUNAS, NM

## TRAXXAS T-MAXX AND E-MAXX

Neither of these Traxxas flatbeds are shelf queens; Jesse tells us that he drives them often. A Traxxas E-Maxx pulls the custom-made trailer that transports his T-Maxx. The trucks feature mostly RPM and Pro-Line aftermarket parts that keep them running in tiptop shape.

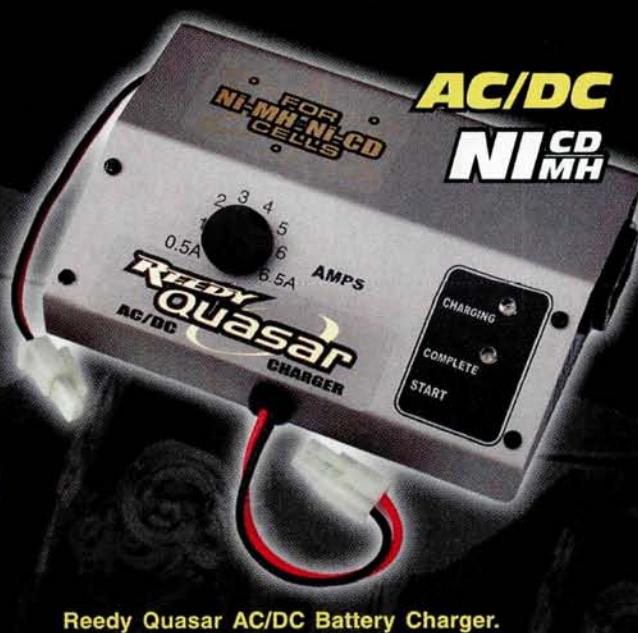
RAFAEL QUINONES, SAN JUAN, PR

## POWER RACING SWIFT RTR BUGGY

Rafael recently experienced the fun of an 1/8-scale nitro buggy firsthand with his new Power Racing Products Swift RTR buggy, and he loves his new ride. The only thing he added is a Race Guard fail-safe unit from Dynamite to prevent any runaways that could wreck his car. Have fun with your new car, Rafael!



**Got  
a New  
RTR?  
Power it  
up with  
Reedy!**



### Reedy Quasar AC/DC Battery Charger.

Reedy's economical #610 "Quasar" peak-detecting charger plugs right into the wall (or works from any 12V power source) and adjusts from .5 amps to 6.5 amps to charge Ni-CD, Ni-MH or receiver packs.

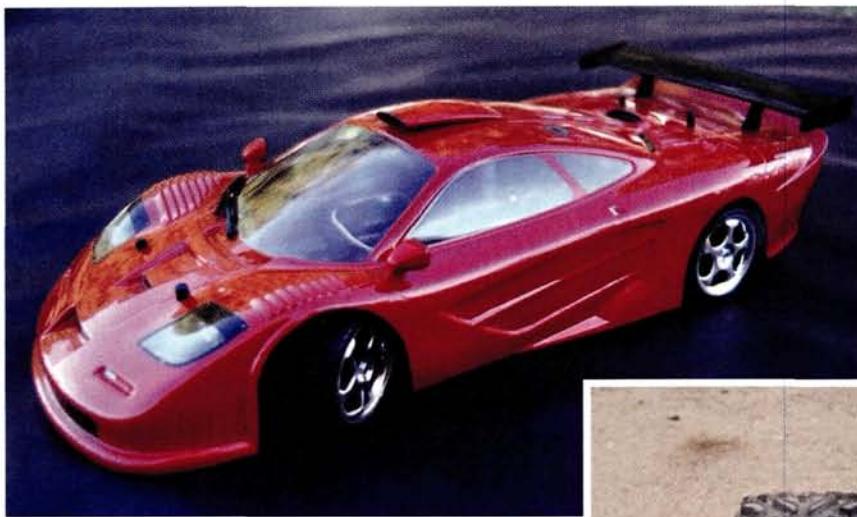
#610 Reedy Quasar AC/DC Charger

**Reedy Tire Warmers.** Be ready for racing from the very first lap! Reedy Tire Warmers work from your 6-cell battery pack to pre-heat your touring car's rubber tires to race temperature.

#608 Reedy Tire Warmers



# REEDY



ANDY ONORATO, SHAMONG, NJ

**HPI RS4 PRO**

This well-shot photograph shows Andy's HPI RS4 Pro, his pride and joy. It's fitted with a Kyosho McLaren F1 body and is set up for racing with a Team Orion Orbital 2 Pro BB motor, an LRP F1 Pro ESC, Hitec radio system and Pro-Line Road Rage tires. Andy tells us his car tears up his local track, where he races with his father, Ken.

**LEE SULOUFF, IRAQ**  
**TRAXXAS E-MAXX**

When off duty in Iraq, Staff Sgt. Sulouff passes his time with his Traxxas E-Maxx. To his stock truck, he added Associated motor heat sinks and shocks, Barnburner CNC aluminum chassis braces, MIP CVDs, Pro-Line Velocity 40 series wheels fitted with Big Joe tires, Trinity Maxx Wild motors, Robinson Racing pinion and spur gears and a host of other aftermarket parts that protect it from the extreme heat and sand.



**Reedy's "Rated-X" Matched sport packs.** Fully assembled in clear tubes so you can see the matching info right on the label of each cell. Don't settle for "mystery" cells in your sport packs... get Reedy's "X-Rated" packs and see the power you've been missing!

#697 Reedy "Rated-X" Sport Pack, Sanyo 3300 cells

#699 Reedy "Rated-X" Sport Pack, Panasonic 3000 cells

**Reedy Ni-MH Receiver Packs for Nitro Cars and Trucks.** Reedy receiver packs give you the long-lasting, reliable power needed for nitro racing, and have a great low price that makes them your **BEST** choice!

#615 Reedy Ni-MH Receiver Pack, (Hump style for RC10GT, Monster GT, Etc.)

#614 Reedy Ni-MH Receiver pack, (Flat style for Nitro TC3, etc.)

**ONLY  
\$59.99**

**ONLY  
\$64.99**

Reedy "Spec 19 Quad-Mag Motor.

Step up the power of your RTR with Reedy's Quad-Magnet "Spec 19" Motor! A great choice for the B4 RTR, the TC3 RTR, or any Ready-to-Run electric with a speed control rated for a 19-turn or less motor.

#513 Reedy Spec 19 "Quad-Mag" Motor

*A Division of Associated Electrics  
3585 Cadillac Ave. Costa Mesa, CA 92626*

**WIN AN OFNA YO-YO & AN RC CAR ACTION SUBSCRIPTION!**

Do you have a Pit Tip idea? Submit it, and you could win a 6-month subscription (or an extension of your subscription) and an OFNA yo-yo. "Tip of the Month" winners will be considered for a grand prize—an OFNA RTR. Send a sketch or photo to "Pit Tips," *RC Car Action*, 100 East Ridge, Ridgefield, CT 06877-4606 USA. Print your name and address clearly on each tip you submit. You may also email your tip to [pitips@rccaraction.com](mailto:pitips@rccaraction.com). Sorry; we can't acknowledge every tip or return the ones we don't use.



**CROSSPIN HOLDER**

Tired of your axles' crosspins falling out? Use a toothpick to place a dab of silicone-type glue into the hole before sliding in the crosspin. This will prevent the pin from sliding out on its own, but the plug of dried glue will be easy to remove when it's time for a rebuild.

*Tim Patterson  
Stratford, NJ*



**NO-SLIDE CORNER DOTS**

Grip tape used for the top of a skateboard deck works perfectly to prevent corner dots from drifting. It provides excellent grip, is self-adhesive and is thin enough so the dome is flush to the ground.

*Mark Daily  
Bryan, TX*

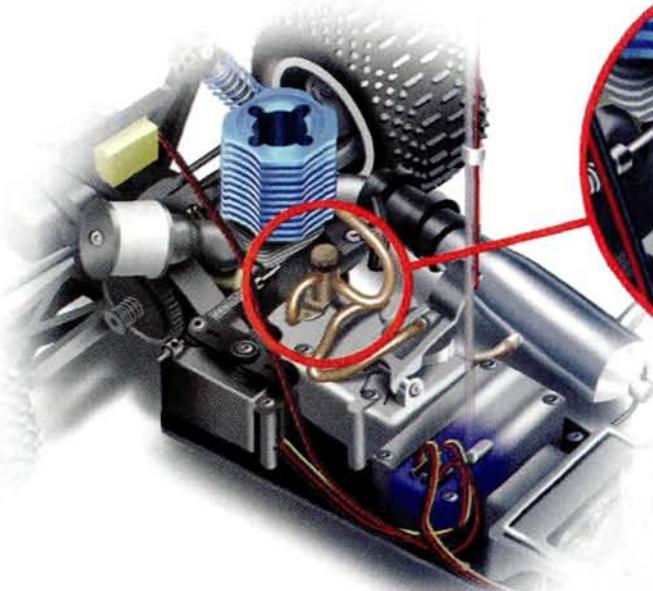


**GIP OF THE MONTH**

**COOL YOUR GUNS**

It's annoying to have to wait for your soldering iron to cool before you can pack it away after a day at the track. To speed up the process, blast the tip with an air compressor.

*Robert McCubbin  
Medford, NJ*



**EASY ENGINE SHUT OFF**

This tip not only makes it easy to stop your engine, but it also allows you to completely shut off the fuel flow so you can run the engine dry before storage. Shut-off valves for use on aquarium air lines can be found at most pet stores, and they're very inexpensive. To install one, cut the fuel line that's between the tank and the carb, and

insert the valve into the line. Use fuel-line clips or zip-ties to help secure it. When you're ready to stop the engine, just flip the valve. It's a lot easier than trying to pinch the fuel line with your fingers—especially with the body still on.

*Andrew Plante  
Blackstone, MA*

### IT'S GETTING CLEARER

If you make a major painting goof on your new body, you can use mineral spirits to strip the paint without clouding the Lexan. Using a soft cotton cloth (terry cloth works well), apply the thinner to the painted surface in a circular motion. Let the mineral spirits soak in for a minute, then gently rub off the loose paint. To remove the bulk of the paint, periodically re-wet the cloth with mineral spirits during this process and use a new, clean cloth for the final cleaning. Wash the body with dish detergent in warm water to clean off any oily residue.

Ian & Isaac Leslie  
Rollinsford, NH

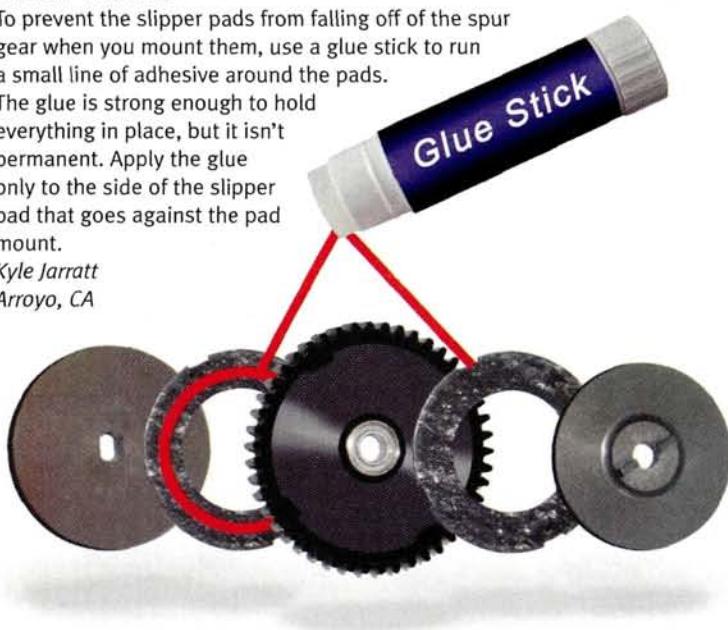


### STICKY SLIPPER

To prevent the slipper pads from falling off of the spur gear when you mount them, use a glue stick to run a small line of adhesive around the pads.

The glue is strong enough to hold everything in place, but it isn't permanent. Apply the glue only to the side of the slipper pad that goes against the pad mount.

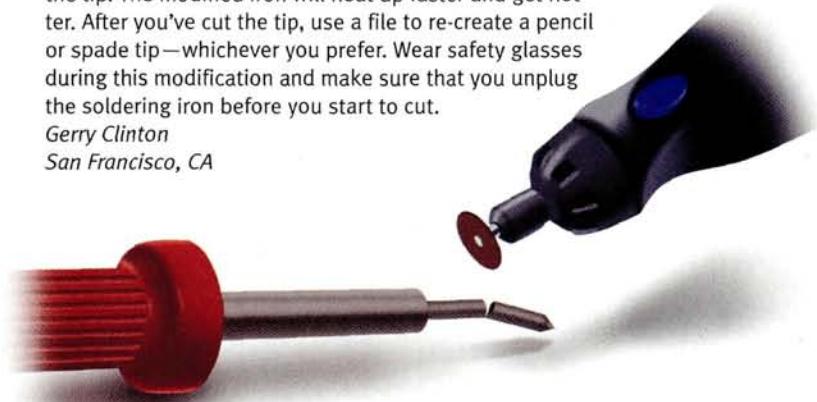
Kyle Jarratt  
Arroyo, CA



### SHORTENED SOLDER TIP

There's no denying that the high-end soldering irons deliver the best performance, but you can improve your inexpensive pencil-tip soldering iron. Use a hacksaw or Dremel tool with a cutoff wheel to remove about half of the tip. The modified iron will heat up faster and get hotter. After you've cut the tip, use a file to re-create a pencil or spade tip—whichever you prefer. Wear safety glasses during this modification and make sure that you unplug the soldering iron before you start to cut.

Gerry Clinton  
San Francisco, CA



### TANK TEST

A leaky fuel tank can cause problems other than just spilled fuel. An air leak can make the engine run inconsistently and will send you on a wild goose chase when you try to tune your engine. To test a suspect tank, remove it from the vehicle and completely empty it. Next, apply regular dishwashing soap to all of the seams and seals and attach a short length of clean fuel tubing to the inlet nipple. Cover the outlet nipple with your finger and blow into the fuel line. Bubbles will appear over any leaks.

Nathan Stover  
Attica, OH

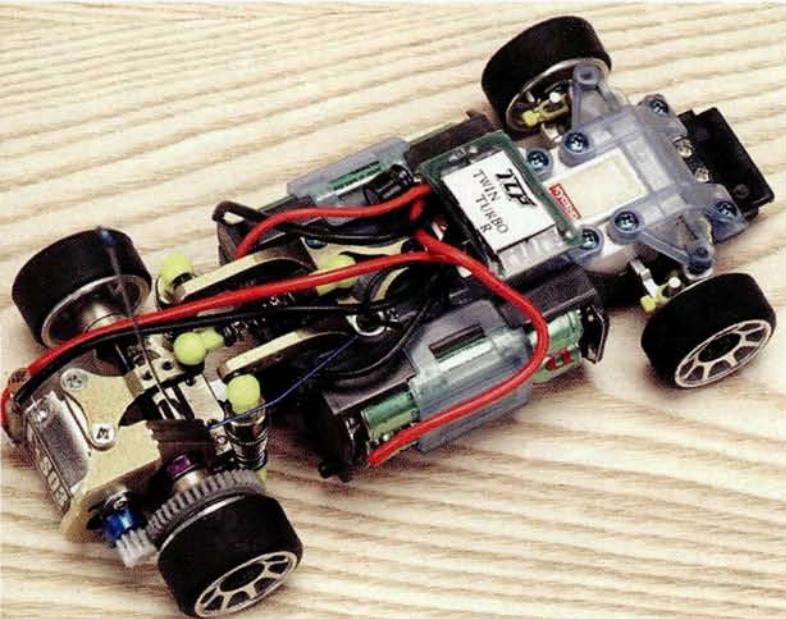


"Pit Tips" are submitted by readers and are screened for functionality, feasibility and safety but are not tested by *Radio Control Car Action*. *RC Car Action* and the submitting authors are not responsible for personal injury or damage to models or tools resulting from readers' use of "Pit Tips." Readers are strongly encouraged to check their equipment's warranty before they perform any modifications.

# Troubleshooting

YOU'VE GOT PROBLEMS? WE'VE GOT FIRES. BY GEORGE M. GONZALEZ

► **NEED HELP?** Send your "Troubleshooting" questions and comments to troubleshooting@airage.com, or mail them to "Troubleshooting," c/o RC Car Action, 100 East Ridge, Ridgefield, CT 06877-4606 USA.



**A Mini-Z turbo is an external ESC that bypasses the stock electronics to allow the use of higher power mod motors. Installing a turbo is straightforward, but you'll end up with a mess of wires on the chassis. Organizing the wires can be difficult, but it's worth the hassle because you'll be able to install super-high-power motors on your Mini Z.**

Q

## TURBOCHARGED MINI-Z

I have a Kyosho Mini-Z Racer with the MR-02 chassis. I want to have the fastest Mini-Z around, so I ordered a pro modified, ball-bearing racing motor. The car is now unbelievably fast, but after a few minutes of running, the throttle and steering get twitchy and the car loses power shortly afterward. I'm using the stock spur gear and a 9-tooth pinion. Do I have the motor overgeared? I've been told that I need to install a turbo. What's a turbo? Will installing one solve this problem? [email] **Mark Rios**

A

Basically, your mod motor is drawing more amps than the stock ESC is designed to handle. The higher current load causes the ESC to overheat, and this is where the problems start. Continued use of this motor will permanently damage your car's vital electronics. In Mini-Z terms, a "turbo" is basically an external electronic speed control (ESC) that bypasses the stock ESC to allow the use of high-power modified motors. GPM, TLP and Works for Competition offer turbo systems for the Mini Z, and installing one is fairly straightforward. Most turbo systems have wires that have small eyelets soldered to the ends. These must be secured to the motor tabs on the ESC with the stock screws and to the positive and negative battery terminals. You'll also have to solder lead wires directly to the motor. Installing a turbo is easy, but you must be very careful. Follow the instructions to the letter because an incorrect installation can damage your car's vital electronics.

## REAL PERFORMANCE PRODUCTS!

### T-Maxx/2.5-Maxx Steel Top Shaft

NEW



This precision machined **hardened** steel top shaft will fit all T-Maxx. Includes oversize ball bearing. RRP 8525

### T-Maxx/2.5-Maxx FORWARD ONLY Steel Gear Kit

NEW



This kit contains a 26T **hardened** steel output gear, a forward drive hub adaptor, a steel spacer and Pin. RRP 8586. **Hardened** aluminum version RRP 8585.

### T-Maxx/2.5-Maxx Hardened Forward Primary Gear

Precision machined from solid steel and then **hardened**. RRP 8529. **Hardened** aluminum version RRP 8528. NEW

### T-Maxx/2.5-Maxx Forward Primary and Reverse Gears

NEW



This kit contains a precision machined **hardened** steel primary forward gear, a **hardened** aluminum reverse gear and pin. RRP 8521

## MAKE NO COMPROMISES!

### T/E-Maxx/2.5-Maxx Accessory Spurs



A wide range of spurs fit our Double-Disc Slipper Kits. Choose from machined Super-Tough plastic spurs in 66, 68, 70, 72, 74 and 76T sizes, RRP 82XX, or CNC machined steel spurs available in 65, 72 and 76T sizes, RRP 83XX. Small Clutch Plate/Gear Adaptor fits 65 thru 70T spurs. Large Clutch Plate/Gear Adaptor fits 72 thru 76T spurs.

### T-Maxx/2.5-Maxx Primary Reverse Gear

This gear is precision machined from solid aluminum and **hardened**. Includes pin. RRP 8522



NEW

### T-Maxx/2.5-Maxx Lightened Spur And Double-Disc™ Slipper Kit



RRP's NEW line of Lightened Spur and Double-Disc Slipper Kits for Traxxas Nitro and T/E-Maxx/2.5-Maxx trucks are designed to improve performance and increase reliability. This combo incorporates a machined steel or Super-Tough plastic spur, a Vented Aluminum Clutch-Plate/Gear Adaptor, 2 Slipper Pads and 2 Plates to deliver the adjustability you need and the increased performance that you demand. **Complete Slipper Kits** are available in the following sizes: RRP 8166 Slipper Kit with 66T Super-Tough plastic spur (Stock Size) for E-Maxx RRP 8172 Slipper Kit with 72T Super-Tough plastic spur for Traxxas Nitro RRP 8465 Slipper Kit with 65T Steel Spur for Traxxas Nitro RRP 8472 Slipper Kit with 72T Steel Spur (Stock Size) for T-Maxx Spur, Clutch-Plate/Gear Adaptor and Slipper Pads also sold separately.

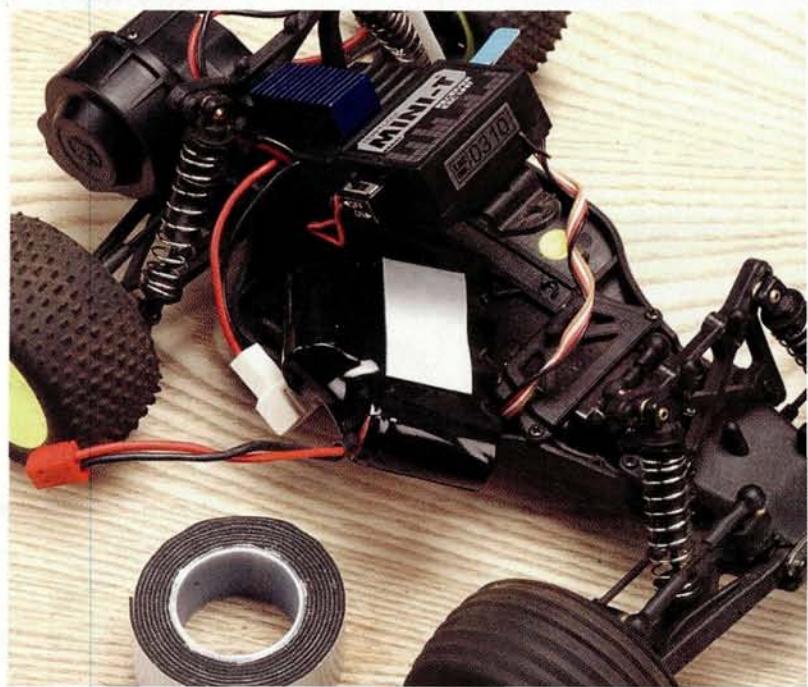
**Q****SUPERCROSS MINI-T**

I bought a Team Losi Mini-T for my son at Christmas, and the little truck is so cool that I had to buy another one for myself. We've set up a small track on the side of our house with lots of corners, elevation changes and big jumps everywhere. The trucks are a blast, but I broke the upper servo brace that secures the ESC, receiver tray and battery to the main chassis. The same day I installed the new part on my truck, my son broke the same part on his truck. Right now, the battery pack and ESC/receiver combo are secured on my son's truck with duct tape while we wait for a replacement brace. Is there a company that makes an aluminum servo brace for the Mini-T? Do you have any advice on how to mount the electronics more securely?

**Dennis Jenkins**  
 Fort Pierce, FL

**A**

I'm assuming that your trucks are equipped with aftermarket 5- or 6-cell battery packs because the stock 4-cell battery holder fits very securely on the chassis and shouldn't cause any problems. I'm also assuming that you are using the optional battery holder that's included with the truck because if you don't use it, the battery pack will slide around on the chassis. If the upper servo brace broke while the battery pack was properly installed, stick a piece of servo tape or use a dab of Shoe-Goo on the top of the battery pack to form a bond between the ESC/receiver tray and the battery pack. This will hold the pack more securely. Check out the photo and you'll see what I mean. If you've just gotta have aluminum, GPM offers an aluminum upper brace that should be stronger than the stock plastic part.



Installing a small strip of servo tape between the battery and the ESC/receiver tray will prevent the battery pack from moving or bouncing around during extreme driving. This can prevent the upper servo brace from being damaged.

**T/E-Maxx/2.5-Maxx Steel Diff Gear Set**

T/E-Maxx/2.5-Maxx differential gear set, includes: 1 beveled pinion gear, 1 beveled spur gear, 4 re-usable stainless steel Phillips head screws, 1 tube Associated Black Grease, and a shim kit for spider gears with 10.003" shims. 2 sets needed per truck. RRP 8590

**DON'T SETTLE FOR SECOND!**

**T-Maxx Vented Flywheels**

Aluminum vented flywheels move air over clutch bell, improving performance and cooling. RRP 8551 Blue, RRP 8550 Natural Silver

**NEW 2.5-Maxx Vented Flywheel, Blue Only RRP 8552.**

**T-Maxx/2.5-Maxx Aluminum High Performance Brake Kit**

New, lightweight aluminum high performance brake kit, includes bigger, more aggressive brake pads and steel backing plates. One piece vented rotor minimizes side-to-side wobble. Also fits newer T-Maxx. RRP 8562  
 Older style half shafts use Brake Kit RRP 8560.

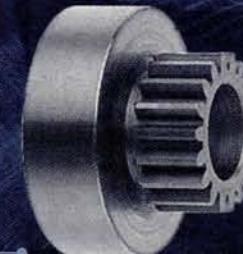
[www.robinsonracing.com](http://www.robinsonracing.com)

**ROBINSON RACING PRODUCTS**

4968 Meadow View Drive · Mariposa, CA 95338 · Voice 209.966.2465 · Fax 209.966.5937

**T/E-Maxx/2.5-Maxx Replacement Pinion**

This precision machined steel pinion fits RRP 8590 Diff Gear. RRP 8591

**T-Maxx/2.5-Maxx Hardened Steel Clutchbells**

CNC Machined from solid steel these bells are built to last. They take the 5x11 bearing (NOT included). Available in 19T, RRP 8119, 20T RRP 8120, 21T RRP 8121 and 23T RRP 8123.

## Q

### PESKY BALL CUPS

My Team Associated T3 RTR runs great, but the ball cups keep popping off the ball studs. The problem is mainly with the rods that are attached to the steering bellcranks and steering blocks. I have to keep a pair of pliers in my pocket to pop the ball cups back on every time I run the truck. For some reason, none of the other rods pop off. The truck is basically new; I've only run it a few times. Is this problem normal? Can I do something to prevent the ball cups from popping off? [email]  
Justin B.



## A

The ball cups will pop off the ball stud during a hard crash, and that's a good thing because it prevents some of the suspension components from being broken. If the ball cups seem to pop off too easily during minor crashes or impacts, however, they may simply need to be replaced. When ball cups wear out, they become loose, but at about \$5 a dozen at most hobby shops, they aren't expensive to replace regularly. If you'd like to upgrade to something stronger, RPM offers beefy molded ball cups that outlast most stock ball cups. If you need a quick fix and don't live near a hobby shop, you can crimp the ball cups for a more secure fit. Use pliers to lightly crimp the ball cup while it's attached to the ball stud. Don't squeeze too hard or you'll damage the ball cup. You'll know when the ball cup is fitted correctly because it will pivot freely on the ball stud. If the ball cup binds, it isn't properly secured on the ball stud.

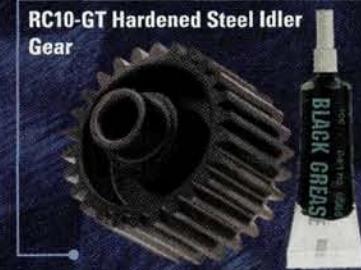
**While the ball cups are installed on the ball studs, gently crimp them with pliers to improve their fit. Don't overdo it; the ball cups should pivot smoothly without binding. This ensures a proper fit and will prevent the ball cups from popping off the ball studs during minor crashes.**

#### RC10-GT Steel Combo



Precision machined from solid steel, then hardened, this 65T spur and 15T bell combo will last and last. RRP 2365

#### RC10-GT Hardened Steel Idler Gear



Cut from solid steel stock, this RC10-GT gear is lightened and hardened for super quiet precision and extra long life. Black tranny grease included. RRP 2213

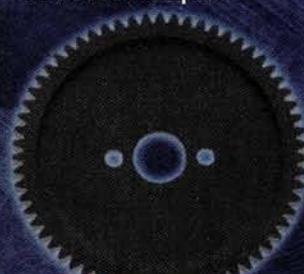
#### Associated Titanium Stealth Top Shaft



CNC Machined from solid titanium, this super hard, super light top shaft will fit any Stealth transmission. RRP 1512.

[www.robinsonracing.com](http://www.robinsonracing.com)

#### RC-10GT 32 Pitch Spurs



Precision machined from heat-resistant, super tough plastic, these spurs mesh flawlessly with our Clutchbells. Available in 63T thru 67T, RRP 2263 - RRP 2267.

#### Hardened Diff Gear



Hard anodized, precision CNC machined aluminum diff gear. RRP 1513 RC10-GT

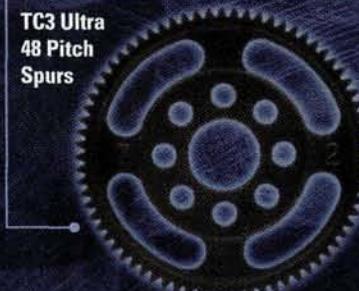
#### RC-10GT Hardened Steel Clutchbells



These steel Clutch Bells are CNC machined from solid steel then the teeth are machined on. This makes the part stronger with less gear "run out". Available in 14T thru 20T, 22T and 24T. RRP 22XX

**DON'T SETTLE FOR SECOND!**

#### TC3 Ultra 48 Pitch Spurs



Precision machined from heat-resistant plastic, these spurs mesh flawlessly with our pinions. Available in even numbers from 70T thru 80T, RRP 1670 - RRP 1680.



## Q STUBBORN BATTERY BOX

I just bought an XTM Racing X-Terminator, and boy, does this thing rip! I decided to race the buggy, so I installed a fresh set of batteries in the transmitter and 4-cell holder and headed to the track. The buggy made nice lines and the airtime seemed endless over the jumps. Everything was going great until I landed the buggy hard off one of the jumps; the battery box opened and ejected the batteries. Fortunately, the buggy landed on its roof or it would have run away. I have had the same problem before and wonder whether the problem will continue if I replace the battery holder with a rechargeable battery pack? Do you know of a better way to mount the onboard battery pack on the chassis? [email]

Devon Stacey



Installing a couple of zip-ties will keep the battery box lid securely closed.

**A** The X-Terminator's battery box has a convenient snap-shut lid that works well during most driving conditions. Unfortunately, the lid has been known to pop open and spill the batteries when the buggy crashes hard or has a nose-first landing. The easiest way to secure the battery-box lid is with a couple of zip-ties. Simply drill two small holes on the lid and two more on the battery box (as shown in the photo) and secure the lid to the battery box with zip-ties. If you install a charging jack, you won't have to open the battery box each time the battery pack requires charging. ■

## TOOLBOX

### DuraTrax Pit Tech Removable Threadlocker

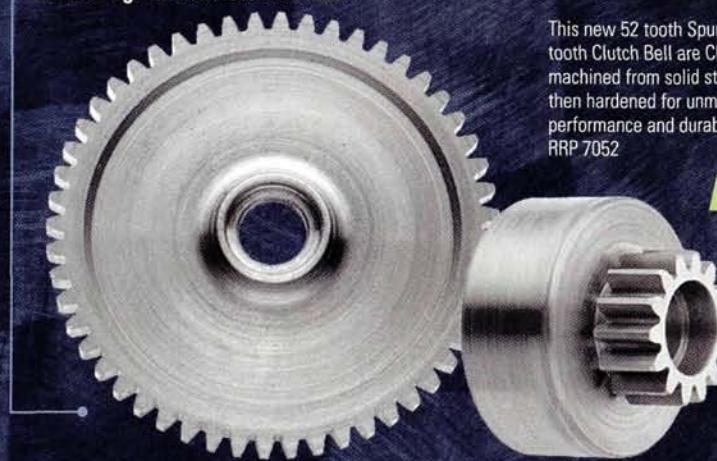
Screws and other fasteners that are threaded into metal can easily vibrate loose unless you use a thread-locking compound on them.

DuraTrax Pit Tech Removable Threadlocker is a medium-strength thread-locking compound that is perfect for most RC applications where screw removal is required for maintenance. Pit Tech Threadlocker is sold in a small, 2-ounce bottle that is a perfect fit for any toolbox or pit bag.



**Pit Tech Removable Threadlocker**—item no. LXFHY2; \$2.99. DuraTrax distributed by Great Planes Model Distributors (217) 398-6300; (800) 682-8948; [duratrax.com](http://duratrax.com).

### HPI Savage 21 Nitro Steel Combo



This new 52 tooth Spur and 14 tooth Clutch Bell are CNC machined from solid steel and then hardened for unmatched performance and durability. RRP 7052

**NEW**

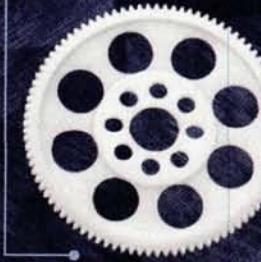
### HPI Savage 21 Nitro Vented Flywheel



Aluminum vented flywheels move air over clutch bell, improving performance and cooling. RRP 7000

**NEW**

### Stealth Spurs



These precision machined spur gears are super quiet. They're available in 48P in 60T thru 96T sizes, and fit any Associated or HPI electric car or truck. RRP 1860 thru 1896.

### Electric Car And Truck Pinions:

#### 48P Absolute Series Pinions



Super hard, lightened and cut with unmatched precision. Great with any spur, but with an Absolute spur, even on-off noise is gone! Available in 48P in 16T thru 28T sizes. RRP 1416 - RRP 1428.

#### 48P / 64P SuperLite Aluminum Pinions



They're lightened, hard coated and precision cut. Available in 48P in 16T thru 28T, and 64P in 24T thru 38T. RRP 30XX (48P) and RRP 31XX (64P). Only \$5.25

#### 48P Hard Nickel Plated Steel Pinions



These precision cut gears have an extremely hard coating that makes them really last. Available in 12T thru 35T. RRP 1012 - RRP 1035



# Tamiya TLT-1 Rock Buster

**TAMIYA'S NEWEST MONSTER TRUCK** may be  $\frac{1}{18}$  scale, but don't call it a "mini." Its footprint isn't that much smaller than a  $\frac{1}{10}$  stadium truck's, and it accepts full-size radio gear and a 540 motor. That makes it convenient to build and fully "off-roadable," yet it's still small enough for indoor running and is far more maneuverable than any  $\frac{1}{10}$ -scale monster machine. And it has lots of big-truck features; the short list includes an aluminum ladder-style chassis, solid-axle "real-truck" suspension (with cantilevered aluminum shocks) and a center differential. The TLT-1 is a whole new way to go monster trucking, and it has the makings of a monster hit.

**miniaturized  
MONSTER**



A close-up, low-angle shot of a Tamiya Rock Ruster TLT-1 remote-controlled truck. The truck is primarily blue with yellow and orange flame-like graphics on the side panels. The word "ROCKRUSTER" is printed in large, bold, orange letters, with "TLT-1" in smaller blue letters below it. A small red "EXPC" logo is visible on the side panel. The truck is shown from a front-three-quarter view, angled towards the left. The background is a bright, cloudy sky. The truck is positioned on a textured, light-colored surface, likely sand or gravel.

ROCKRUSTER  
TLT-1

**KIT FEATURES**

**CHASSIS.** The TLT-1's aluminum ladder-style chassis consists of two main stamped-aluminum plates. The plain-looking side chassis plates are held together with several round aluminum and steel braces and a few plastic center sections. At the truck's center is a transmission assembly that stiffens the chassis package considerably. When assembled, the chassis is as rigid as they come; there's hardly any flex.

Two, upper plastic trays are nested between the chassis: the front one holds the receiver and ESC, and the rear one supports the TLT-1's special battery pack (more on that later). Unfortunately, the two plastic trays are among the few weak spots on the truck. The trays are sandwiched between the chassis plates and are secured with screws and nuts. The plastic area that secures the nut is a little on the thin side, and when you tighten the screws, even gently, the plastic has a hard time properly holding the nut, which simply rotates in place. Admittedly, this is a small gripe, but it's a gripe, nonetheless.

**DRIVE TRAIN.** The TLT-1 has a centrally located transmission. A standard-size 540 motor (which is not included) transmits power to a large spur gear. The spur gear is so large that Tamiya actually had to make a cutout in the side of the chassis to make it fit. To keep it protected from dirt, Tamiya placed a form-fitting Lexan spur cover over the protruding gear.

The spur gear spins a belt that's connected to an adjustable center ball diff. Front and rear propeller shafts exit the center diff, which in turn spins the front and rear gear diff that's equipped with solid axles. If you look closely, you'll see that the axles are very much like the ones used on Tamiya's 18-wheeler big-rig trucks, but they come with C-hubs attached at each end to handle the steering chores. The front and rear solid axles are attached to the chassis via a 4-link suspension setup.

**SUSPENSION AND STEERING.** The TLT-1's 4-link suspension is supported by cantilever-actuated shocks. Cantilever suspension typically provides exceptional axle articulation and ground clearance when using a solid-axle design. The TLT-1 has a respectable amount of suspension articulation, and the included gold-anodized aluminum, fluid-filled shocks work quite well. The truck could benefit from some minor tweaking of the suspension geometry to maximize suspension travel. I've heard that this may be addressed with certain Tamiya optional components in the future. And as far as ground clearance is concerned, there isn't really much to speak of. If you plan to run the truck on relatively smooth surfaces (by off-road standards), you won't encounter any problems. On more uneven terrain, the diff assemblies and center skid area will certainly be more susceptible to getting hung up when crawling over objects.

The steering system is fairly straightforward. The steering servo is mounted atop a plate that's bolted to the front axle assembly. The servo is tied into the front steering knuckles with a pair of long tie rods. The only drawback I found with the steering setup is the actual position of the steering servo. It sits atop the front axle, and when the suspension goes through its range of articulation, the servo bottoms out on one of the chassis brace cross-members. Your best bet is to run a servo with as low a profile as you can.

One cool feature of the TLT-1 is that you can easily set it up with four-wheel steering. The rear axle arrangement is identical to the front one, so you can add a rear steering servo at any time. The truck has an impressive turning radius with the single steering servo up front; I'll stick with that for now. I plan to experiment with the four-wheel steering setup and to turn this truck into a crazy rock crawler.

**BODY, WHEELS AND TIRES.** The body is very similar to the one found on Tamiya's  $\frac{1}{10}$ -scale TXT-1. You can easily re-create the body displayed on the box with a two-color paint scheme and the included decals. Interestingly, the diminutive TLT-1 body had nearly doubled in weight after we had painted it and put on the decals.

As for the wheels and tires, the TLT-1 comes with chrome-plated plastic wheels with standard Chevron-style mini-tires. They look like the rollers that come with Tamiya's Wild Willy 2, but they're actually smaller.

**BUILDING & SETUP TIPS**

Assembling the TLT-1 was a relatively simple task. Here are a few tips and tricks I learned throughout the process to help things go as smoothly as possible.

**STEP 7. Motor installation:**

I didn't have the motor I wanted to use while I was building the truck. I'm a little impatient and didn't want to stop wrenching so early on, so I continued to assemble the truck and decided to add the motor later; this was a bad idea. I had completed the truck; I looked it over and quickly realized that there wouldn't be an easy way to get the motor in. Take my advice: don't even think about moving on to step 8 until you've strapped in a motor.

**STEP 8. Battery straps:** definitely make sure that you run the nylon bands that secure the battery through the plastic battery tray before you bolt it in between the chassis plates. It's a million times easier than trying to force them through afterward.

**STEP 9. Electronics**

trays: when bolting the plastic receiver/ESC and battery trays in place, be extra careful not to overtighten the screws. The material that secures the nut is a little on the weak side, and if you overtighten the screw, it will stretch the plastic, and the nut will spin in place.



better to the wheel. Be careful though; you want to scuff off the chrome plating only.

**STEP 10. Differential assembly:** if you want to use your truck for rock crawling or you simply want as much forward bite as you can get, pack your diffs with heavy grease when you assemble them. If you plan to build a strict rock crawler, you can JB Weld the diffs together for a solid axle. I recommend that you try heavy grease first; at least, it's not a permanent modification.

**STEP 23. Steering servo:** try to use the lowest-profile steering servo that you can. When the suspension goes through its range of articulation, the taller the servo, the quicker

**you'll need**

- Transmitter and receiver
- Electronic speed control
- Tamiya TLT-1 battery pack (item no. 90492) or similar aftermarket pack
- Steering servo
- Charger
- Tire glue
- Lexan-compatible spray paint (use Tamiya paint PS30/Brilliant Blue and PS6/Yellow to re-create the one displayed on the packaging)

## SPECIFICATIONS

MANUFACTURER Tamiya

MODEL TLT-1 Rock Buster

SCALE 1/10

PRICE \$200

Varies with dealer

## DIMENSIONS

Wheelbase 7 in. (180mm)

Width 9.8 in. (250mm)

## WEIGHT

Total, as tested 66 oz.

(1,905g)

## CHASSIS

Type Twin plate

Material Stamped aluminum

## DRIVE TRAIN

Type Shaft-driven 4WD

Primary 3.46:1 (24T pinion/83T spur)

Transmission ratio 5.69:1

Final drive ratio 19.674:1

Drive shafts Dogbones

Differentials Planetary gear type

Bearing type (F/R) Plastic bushings/bronze bushings

## SUSPENSION

Type (F/R) 4-link/cantilever

Shocks Aluminum-body fluid-filled

## WHEELS

Type One-piece plastic

## TIRES

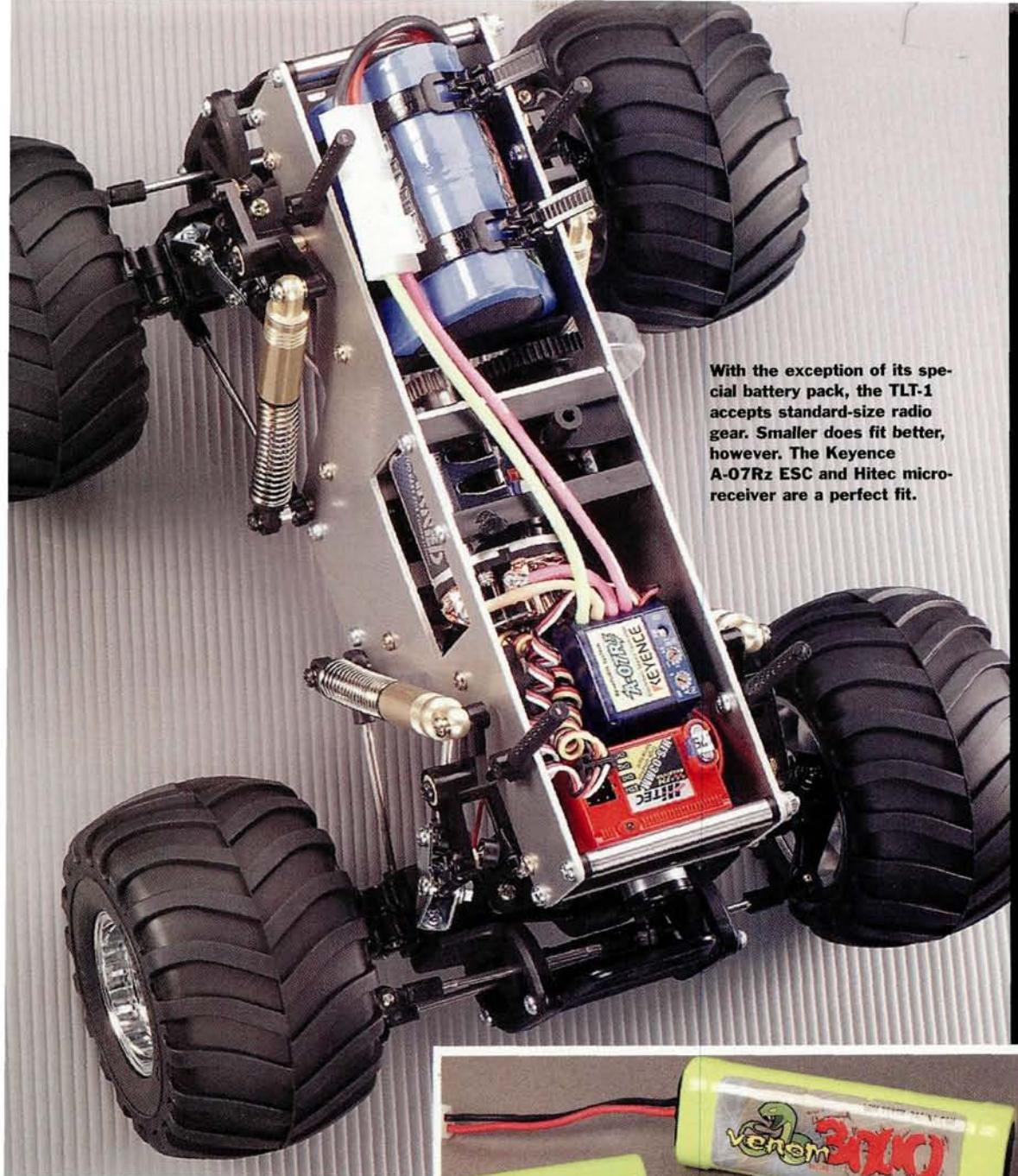
Type All-terrain monster-truck tread

Dimensions 2.04 x 2.1 in.  
(52 x 54mm)

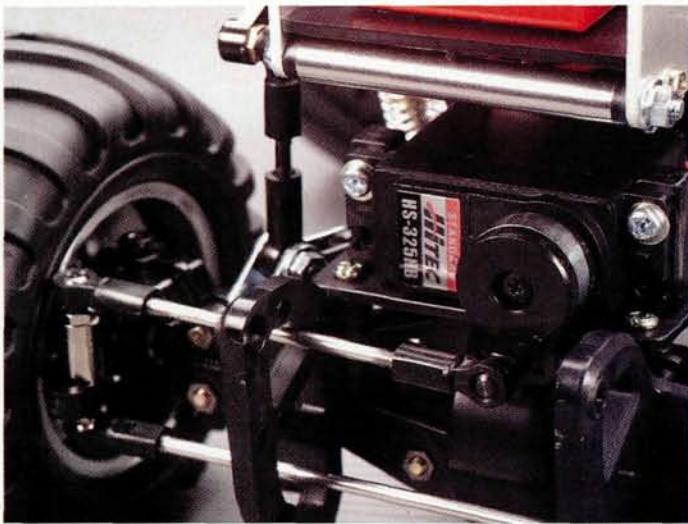
## ELECTRONICS

Not included

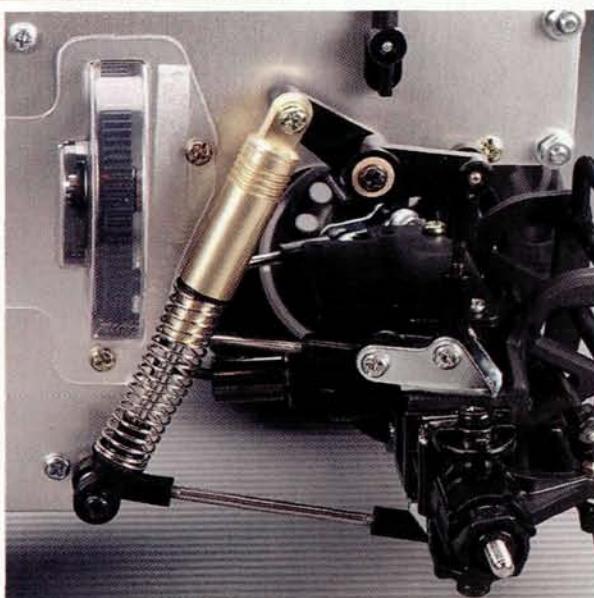
**Left:** the TLT-1 requires a special six-cell hump-style battery pack. Compared with a standard stick pack on the right, the Tamiya hump pack is considerably shorter, and taller. Trinity already has an aftermarket TLT-1 pack.



**Below:** the steering servo is mounted on the top of the front axle; this eliminates bumpsteer and the complex linkages that a chassis-mounted servo would require.



**Right:** the cantilevers don't alter the leverage ratio of the shocks, but they do let you mount the shocks lower than would be possible if they were attached to the axle. The slim gold shocks work well.



# Tamiya's David Jun Talks TLT-1

Not many people are aware that the TLT-1 was originally a concept truck developed and designed here in the good ol' U.S. of A. The man behind the project was none other than David Jun—one of Tamiya's ace sedan pilots and in-house employees. We sat down with David and asked him about the truck, how he came up with the idea in the first place and whether there are more mini monsters in store for us.

**RCCA:** You were very instrumental in the original TLT-1 concept truck's design. What made you think of the idea in the first place?

**David Jun:** About two years ago mini RC began making an impact on our industry and, at the time, all of the mini products were on-road cars.

Monster trucks have always been popular because of the diversity of on- and off-road use, not to mention the fact that everybody likes trucks. So, the concept of a mini monster truck was obvious to me. The original proposal was just on paper and never went anywhere, but two years later, our new sales and marketing manager, Sam Wright, saw the potential and got approval and a budget for me to make the prototype.

**RCCA:** How did you go about building the truck? Were you able to use many existing parts, shocks, drive-train components, etc?

**DJ:** I tried to keep the fabricating to a minimum and used as many existing parts as I could. The hard part was finding the right parts for the job, and most of them ended up requiring extensive modifications. The axles were initially a concern but ended up working out fine.

**RCCA:** How long did it take you to finish the prototype?

**DJ:** It took about three months, but actual time spent on it was about 80 hours. A quarter of that time was just thinking out the layout.

**RCCA:** What was the most difficult aspect of getting the truck up and running?

**DJ:** The drive train was originally going to use a sealed gearbox, but it didn't take long for me to realize that there wasn't any practical way for me to make a gearbox, let alone the gears themselves. Another option was to have the motor drive the center diff directly, but then gearing options would be too limited, especially for rock crawling. This was my biggest dilemma. The solution came to me while I was showing someone my 414m sedan.

414m sedan.

I realized that using the belt-drive system would provide enough gearing options for every extreme, and if it was efficient enough for the 414m, it would be perfect for my mini monster.

**RCCA:** Was it also your decision to run standard 540 motors?

**DJ:** Yes, because you can never have too much power, right? Seriously, all the other micro RC cars use 380 motors, or smaller, so your options are limited. With a 540, you can walk into just about any hobby shop and have a huge selection from stock to brushless. Because of this, my goal was to use as much standard size electronics in general as possible.

**RCCA:** Tell us where you got the tires for your prototype.

**DJ:** I got them off a \$20 RC Big Foot truck. I think the wheels and tires can make or break the scale appearance of any RC car or truck, so I spent two days looking around at various toy stores for the perfect size of wheel and tire.

**RCCA:** From what we've been told, the concept went from prototype to production very quickly. How was it working with the Japanese headquarters on a project like this?

**DJ:** They pretty much took the ball and ran with it. It only took them 3 months to go from getting the prototype to actually shipping production units to their domestic market.

**RCCA:** What aftermarket hop-ups does Tamiya have in store for the TLT-1?

**DJ:** There are so many potential hop-ups for an item like this that it's hard to say what will be first, but I think people would like a trick-looking chassis. I didn't have time to make cool-looking cutouts in the prototype chassis, nor did I think it would really go into the production version.

**RCCA:** We assume this is the first in a series of vehicles in the Little Gear line. Can we expect to see any more soon?

**DJ:** Yes, the TLT-1 is the first in a series of mini RC vehicles, but that's all I'm allowed to say.

**RCCA:** Do you have any particular tuning tip or trick you'd like to pass along? Any hot setups?

**DJ:** Sure. You can use the TA04 gear-differential unit to replace the stock center diff. With the gear diff, you can pack it with 1/8-scale-type silicone lube, which will diff just enough over the rough stuff yet wheelie over obstacles when you want it to. Or you can JB Weld the spider gears to lock them completely for rock crawling.



## LIKES

- > A lot of truck in a little package.
- > Accepts standard-size 540 motor and radio gear.
- > Surprisingly stable handling.

## DISLIKES

- > Motor access is difficult.
- > Needs more ground clearance.

## TEST GEAR



### Keyence A-07Rz

The Keyence A-07Rz packs away a ton of features into its pint-size case. The forward/reverse A-07Rz has an adjustable current limiter, braking time-adjustment function, and a Dash Power mode, which is essentially a temporary "holeshot" current-limiter setup. The ESC provides supersmooth throttle control, has an extremely low on resistance and comes with gold-plated connectors.

Additional items used to complete the Tamiya TLT-1

**Hitec**  
**Aggressor**

**Hitec**  
**HS-325HB**  
**servo**

**Trinity**  
**Rock**  
**Buster**  
**high-voltage**  
**6-cell pack**



**Epic Binary 2**  
**stock motor**



## PERFORMANCE

First, The TLT-1 is unbelievably stable. When I first built it, I ran it up and down the hallways at work on some very high-grip carpet to show it off to the rest of the *Car Action* crew. No matter how hard I tried, I couldn't get the truck to traction-roll. I spent a few minutes motoring up and down the hallway doing high-speed swimmers, but the truck never got loose. As a matter of fact, the suspension was so soft and forgiving that it was fun to watch how much body roll the truck exhibited without even the slightest hint of instability.

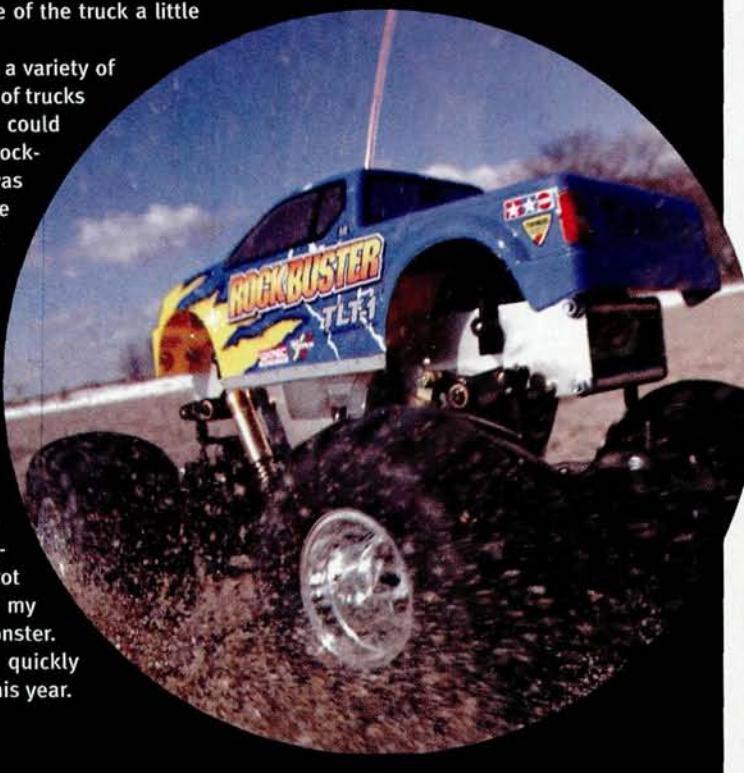
After my hallway adventures were over and done with, I decided to head outside to get dirty. We have a rocky section near the building with plenty of challenging terrain. With a freshly peaked pack, I took the truck over and started toolin' around with it to get a feel for it on the rocks. I worked with the throttle very lightly to try and tryed to crawl with the truck, only to be met with more than a minor challenge. The truck diffed out a little too easily, even though I had cranked down on the diff screw when building the truck. When the front tires grabbed and had a ton of bite, the center diff would unload the rear tires a little too quickly. With the loss of momentum, the truck just didn't have the forward bite needed to get up and over taller, uneven rocks. One thing I might do is swap the TLT-1's center ball diff for a TA04 gear differential and pack it tightly with thick grease. If that doesn't work, I might even try the same setup but will JB Weld the diff together for full-time 4WD action.

With part two of my testing out of the way, I went inside and waited a bit before recharging my next pack. I went over the truck from head to toe to see whether I could find any signs of damage; I'm happy to report that there weren't any significant signs of wear and tear. As my charger beeped, signaling a freshly peaked pack, I gathered the truck and headed outside to a soft sandy area for a backyard romping session. I blasted the truck up and down some loose dirt hills and, after a minute or two, I heard a funny noise. I found that dirt had worked its way inside the transmission case, and a few small rocks were embedded in the spur gear and small countergear on the top shaft. I quickly removed them with the tip of an X-Acto blade and was back in business. I plan to seal the inside of the truck a little better to protect it from dirt.

I had a total blast running the TLT-1 on a variety of terrain. Since I've always been a huge fan of trucks such as this one, I thought about ways I could improve performance and which type of rock-crawler project I could make out of it. It was then I realized that Tamiya had hit a home run with the TLT-1. I seriously can't wait to start tearing the truck apart to build a nasty rock crawler out of it. Stay tuned!

## THE VERDICT

There isn't any doubt that the TLT-1 is a cool little truck. It looks totally badass whether it's sitting on my desk or it's crawling up and over rocks in my backyard. It has a few minor shortcomings, which I think can easily be corrected with a few aftermarket items (flashier side chassis plates with optimized cantilever pivot points and a center gear diff are high on my list), but overall, it's a very solid mini-monster. It's definitely a niche vehicle, but it's quickly becoming one of my favorite releases of this year.



## RATING THE TAMIYA TLT-1

	POOR	FAIR	GOOD	VERY GOOD	EXCELLENT
INSTRUCTIONS	As usual, Tamiya's instructions are among the best in the business.				
PARTS FIT AND FINISH	Everything fit together well, but the tolerances were off on some pieces. Still very good, but not usual Tamiya.				
CORNERING ABILITY	Even though it's tall and has a relatively narrow track, the truck has very stable handling.				
ACCELERATION	Even with a stock motor, the TLT-1 scoots.				
DURABILITY	I managed to flip the truck a few times out on the rocks, but the only damage was a few body scuffs.				

RADAR TESTED TOP SPEED **15 MPH\***

BEST BUYER **Monster truckers with "space" issues.**

\* Top speed varies with equipment used.

## SOURCES

**EPIC MOTOSPORTS** distributed by Trinity Products Inc.

**HITEC RCD INC.** (858) 748-6948; hitecrcd.com

**KEYENCE** distributed by Schumacher USA (813) 889-9691; racing-cars.com; keyence.co.jp/hobby/english/shop.html

**TRINITY PRODUCTS INC.** (732) 635-1600; teamtrinity.com

**TAMIYA AMERICA** (949) 362-2240; tamiyausa.com

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Heavy-Duty One-Way  
Front Differential



Dual-Chamber Blue Anodized Pipe



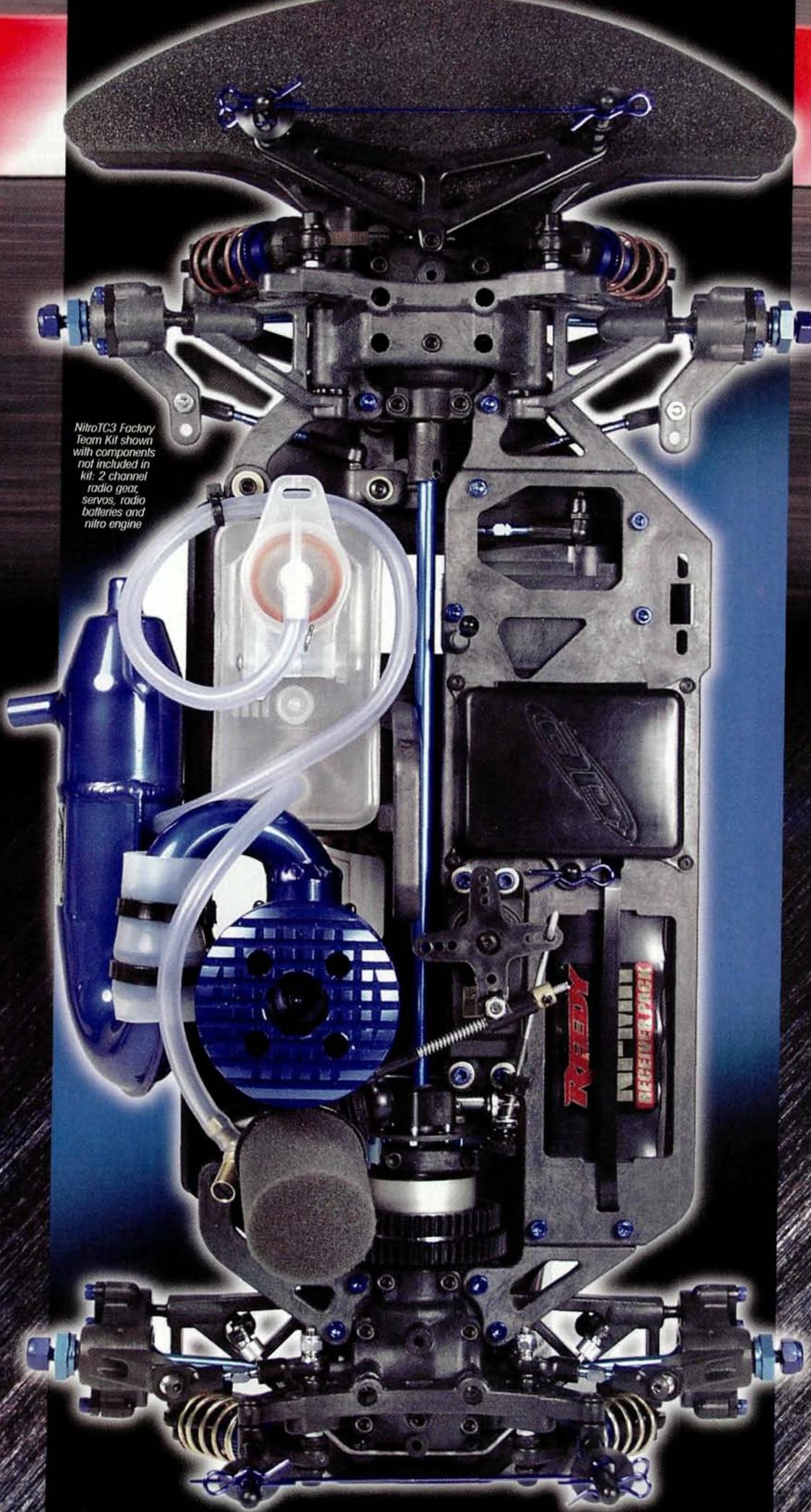
Factory Blue Threaded  
Shock Bodies



Finned Blue Aluminum  
Motor Mounts



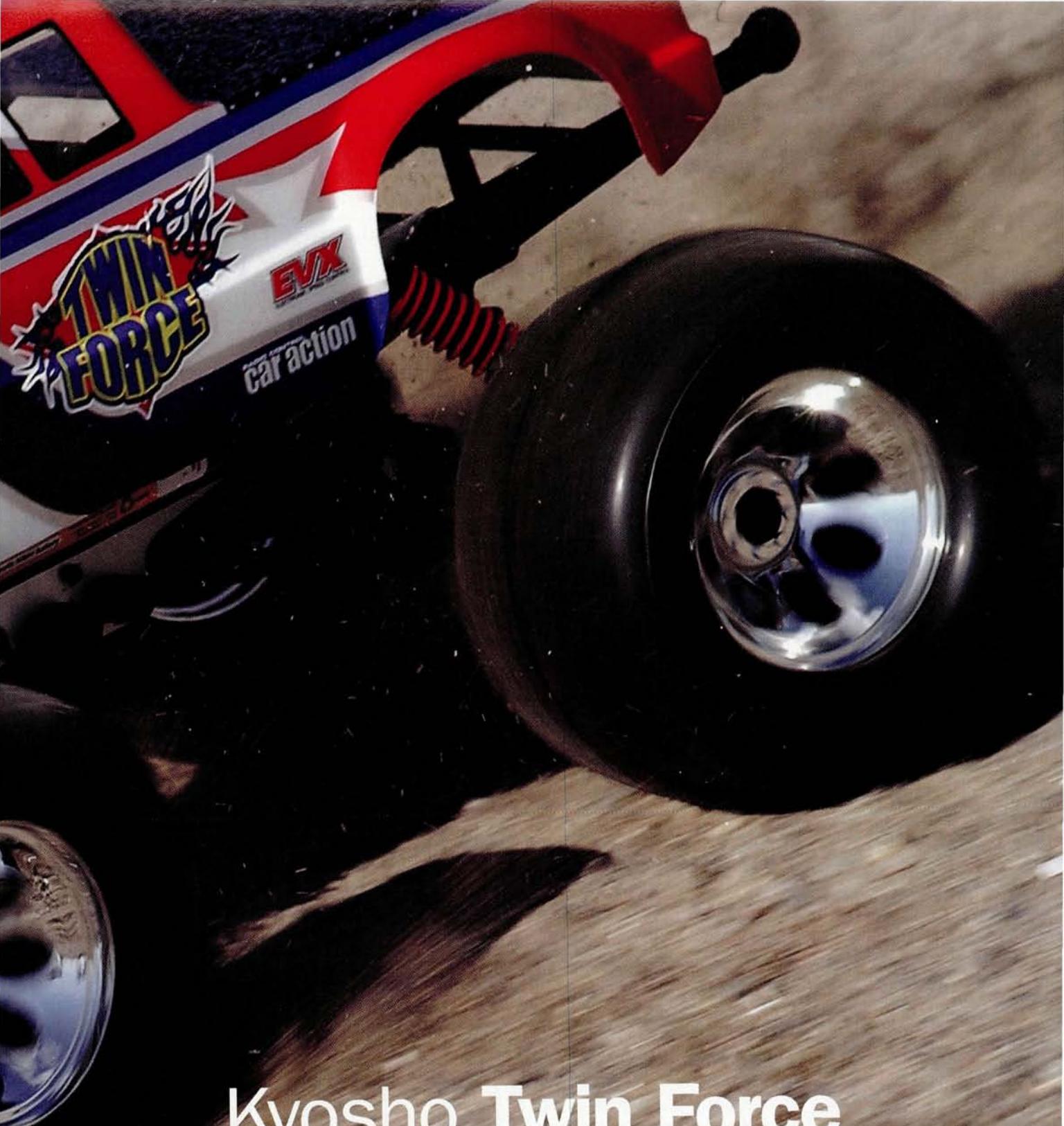
Nitro TC3 Factory Team Kit shown with components not included in kit: 2 channel radio gear, servos, radio batteries and nitro engine





# EVEN BETTER WITH BATTERIES!





## Kyosho Twin Force

WHEN IT COMES TO MONSTER TRUCKS, the nitro guys get to have all the fun. It seems there's another new nitro monster on the market every week, but the electric guys haven't seen much since the E-Maxx and TXT-1 arrived—and that was a looong time ago. Well, get ready for good news, battery boys: Kyosho has electrified the Mad Force. The solid-axle, buggy-diff, chain-drive truck has all the key Mad Force features, but dumps the GS21R big-block in favor of dual 550 motors—hence the new name "Twin Force." A pair of 6-cell battery packs plow 14.4 volts into the motors once you add an ESC that can handle the juice. And which ESC would that be? Why, the Novak-built Traxxas EVX, of course. We all know what that kind of power does for the Traxxas E-Maxx, but is it the right mix for Kyosho's monster?

**KIT FEATURES**

**CHASSIS.** The Twin Force's chassis comes straight from the Mad Force and uses the same simple design. It's made of two 3mm aluminum side plates that are joined by a couple of plastic and aluminum cross members and an aluminum plate in the center of the chassis provides a mounting location for the truck's motors and center-mounted transmission. A pair of battery trays is hung off the sides of the chassis, and each can hold stick or side-by-side battery packs in 6- or 7-cell configurations. The ESC and receiver are housed over the motors in a molded box to keep dirt and mud away from the electronics, but the box also blocks cooling air. A wheelie bar (also borrowed from the Mad Force) is the finishing touch.

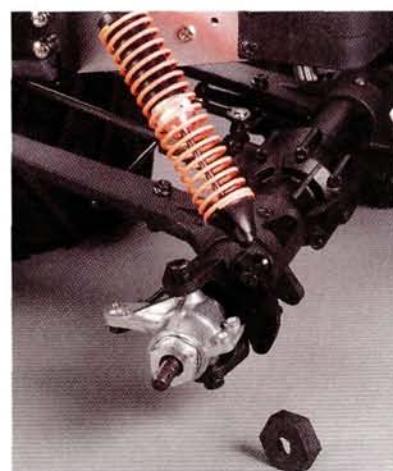
**DRIVE TRAIN.** The stars of the Twin Force's drive train are its dual Kyosho X-Speed Monster 550 motors. The motors straddle a single spur gear, which houses an adjustable dual-pad slipper clutch and is mounted on a shaft between the motors. A small sprocket is hidden behind the spur gear and engages a miniature bicycle-type chain that reaches through the chassis to spin a larger, lower sprocket. The sprocket shares its shaft with the outdrives that are linked to the front and rear axles by steel dogbones. Mad Force fans will tell you that the dogbone driveshafts can eject when the axle reaches its travel limits, but the Twin Force shouldn't have this problem, thanks to its new, longer drive cups.

The axles are built for you at the factory, and house differentials borrowed from Kyosho's world-champion MP-7.5 1/8-scale buggy. The sealed bevel gear diffs are filled with grease, but if you like to wrench you can clean out the grease and tune the diffs by filling them with silicone fluid of varying viscosities. While you're at it, you can install an extra pair of spider gears in each diff; they come with two but can accept four.

**SUSPENSION AND STEERING.** Solid-axle trucks, whether full-scale or RC, generally use a 4-link suspension design, in which two of the links are triangulated to keep the axle from moving from side to side. The Twin Force uses just two links (which are better described as "arms") per axle. The arms swing up and down freely in response to bumps, like a 4-link system, yet they resist side-to-side motion thanks to their flat cross section. The flat arms can also twist torsionally which lets the axles to articulate like those of a 4-link design, although not as freely.

The Twin Force wears a set of new, plastic-body shocks. Instead of the old top-filled design, the new shocks use a Losi-style, bottom-fill design with aluminum seal cartridges. The shock pistons are nutted 1/8-scale style, and have no holes; instead, the fluid flows around each piston to provide damping force. Along with the usual preload adjustments, there are six different mounting positions available for each shock, so there's plenty of suspension adjustability.

The steering servo is mounted up in the chassis. The servo sits in the front of the chassis and is connected to a servo-saver in the center of the chassis via a long linkage. From there, another long linkage reaches all the way to the front axle, where it meets a pair of bellcranks attached to the suspension arms. A drag link connects the bellcranks, and tie-rods connect the steering hubs to the bellcranks. It's as complex as it sounds; and all those linkages give the front end a fair amount of play, but there's no bump steer, and the parts operate smoothly.



The chassis is supported by four plastic-body shocks. The wheel hexes accept Kyosho and Maxx-size wheels.

**BODY, WHEELS AND TIRES.**

The Twin Force's clear body is lifted directly from the Mad Force, and includes overspray film as well as window masks to make painting easier. The wheels and tires, however, are new. The new wheels have a bright chrome finish and look much sleeker than the Mad Force's gusseted wheels. They still use a 17mm hex, but the Twin Force can also accept Maxx-size wheels thanks to a 14mm hex under the removable 17mm hex. But be warned: you'll still have to secure the rim with an oversize nut that may not fit the nut recess of some wheels (so try before you buy).



The Twin Force comes with a new set of tires and rims. The combination is lighter and has better looks than the tires and rims used on the nitro version.

The Twin Force's new chevron-tread tires have a very thin, lightweight carcass and thick rely on thick foam inserts for support. You must glue the strip inserts together before you install them, so they aren't as convenient as a donut-type inserts but they're effective nonetheless.

**BUILDING & SETUP TIPS**

It doesn't take long to get the Twin Force assembled. The chassis and transmission are simple, and Kyosho builds the differentials and axle assemblies for you. Keep an eye on the following as you finish off the assembly.

**DON'T MIX UP THE AXLES**

The factory-built axles are discreetly labeled "F" and "R" to indicate front and rear, but otherwise, they look identical. If you're prone to building things backwards in the excitement of wrenching (aren't we all?), label the front axle with a piece of masking tape or any other can't-miss-it method before you start to build.

**STEP 10: SERVO-SAVER**

The instructions give metric measurements for the assembled linkages. If you don't have your caliper or metric ruler handy, don't get up; there's a metric scale printed along the bottom of the page. It's easy to miss because the centimeter marks aren't numbered.

**STEP 11: GEARBOX**

Or is it a "chainbox"? A miniature bicycle chain is installed in this step, and there's nothing better for a bicycle chain than bicycle chain lube. I like to use a "dry" lube that goes on wet but evaporates to leave a lubricant coating. Pedro's and Finish Line make the best.

**STEP 15: CHASSIS ASSEMBLY**

The instructions say, "Note the direction" because the pattern of screw

holes in the chassis isn't symmetrical. Note the orientation of the holes before you attach the parts, or you may have to repeat step 15.

**STEP 27: STEERING LINKAGES**

More metric measurements, and once again, there's an unlabeled metric scale along the bottom of the step box.

**STEP 35: TIRE VENTING**

The instructions call for a pair of 2mm vent holes in each tire. The best tool for this job is a leather punch because it makes a nice, neat hole (it's also great for adding a hole to belts that you would otherwise be too fat to wear).

**you'll need**

- Transmitter and receiver
- High-torque steering servo
- Two 6-cell batteries
- Charger
- Traxxas EVX speed control
- Tire glue
- Polycarbonate-compatible paint

**factory options**

- Universal center shaft?item no. KYOC6357
- "Hard" chassis plates?KYOC2959
- Double shock stay?KYOC5492
- Turbo long shock (pair)?KYOC0538
- Ultra-soft springs?KYOC5493
- Special steering rod set?KYOC5495
- Aluminum steering bellcrank?KYOC2065

The wheelie bar spends a lot of time in the dirt. If it wasn't there, the truck would flip over every time you nailed the throttle.



## SPECIFICATIONS

**MANUFACTURER** Kyosho

**MODEL** Twin Force

**SCALE**  $\frac{1}{8}$

**PRICE** \$300

(Varies with dealer)

### DIMENSIONS

**Wheelbase** 12.5 in. (318mm)

**Width** 16.25 in. (413mm)

### WEIGHT

**Total, as tested** 159 oz. (4,500g)

### CHASSIS

Type stamped plate

Material 3mm aluminum

### DRIVE TRAIN

Type Exposed chain-drive with solid axles.

**Primary** 18T pinion/50T spur gear

**Transmission ratio** 6.5:1

**Final drive ratio** 21.6:1

**Drive shafts** Dogbones

**Differentials** Grease-filled bevel gear

**Bearing type** Metal-shielded ball bearing

### SUSPENSION

Type Torsion-link trailing arm

**Shocks** Plastic-body, fluid-filled with volume-compensation bladder

### WHEELS

Type Chromed plastic

### TIRES

Type Lightweight, chevron tread

**Below:** the twin Kyosho X Speed motors pack a lot of punch. A slipper clutch assembly helps keep the front wheels on the ground.



**Left:** the Twin Force chassis is set up to hold two 6-cell battery packs. They are easy to install and remove, pull the body clip and that's all it takes.

## PERFORMANCE

I knew I could have gone outside to test the truck but I just couldn't wait to run it. The baseball field is so far away! I plopped the truck down in the hall way and got on the throttle. The truck started off with an explosive wheelie. Cool! I was almost able to get the truck to flip over onto its lid. I could have loosened the slipper clutch to prevent this. Why do that? This thing was way to crazy for the hallway so I went outside. The tires provide the Twin Force with good traction. I didn't have the same wheelie experience outside as I had in the hall. The truck is light and that allowed the tires to spin on the dirt of the baseball field. Spinning tires are fun too! It didn't take long for the Twin Force to reach its top speed of 22.5 MPH because of the low gearing of the transmission. I prefer to have a lot of low-end grunt over high top speed anyway. Things get a little crazy when trucks this big get moving that fast. Slowing the truck down is interesting; it only has rear wheel braking due to the one way bearing in the front drive cup of the center transmission. I had the ESC set for full brakes and easily locked up the rear tires when I got on the binders in the dirt. That caused the rear end to get a little out of control. The steering was responsive and I didn't have any trouble negotiating obstacles, I thought for sure that it would feel sluggish. The turning radius is also impressive, the one way front end makes up for not having a center differential so you gain the steering back that you lose when you eliminate the center diff. The suspension works fairly well over small bumps, but the larger stuff is a different story. The stiff arms don't allow the axles much articulation, so the truck gets tripped up a little on big ruts; over jumps, the Twin Force goes through the air with level flight and soaks the landings up well. When you're in the air with this truck, watch the throttle; it isn't hard to flip over and land on its roof.

## THE VERDICT

As a fan of the Mad Force, I had high hopes for its electric counterpart. The Twin Force delivers; it's an insane wheelie machine that's surprisingly fast and very tough. It's also quiet, so your neighbors can get a respite from screaming nitro noise. The Twin Force's high-speed handling is a little sketchy because of its high CG, but if you want to go fast on a road course, you ought to get a touring car. For electric monster fans looking for that next ride, the Twin Force is a must-drive truck.



## RATING THE KYOSHO TWIN FORCE

	POOR	FAIR	GOOD	VERY GOOD	EXCELLENT
PARTS FIT AND FINISH	████████	████████	████████	████████	████████
ACCELERATION	████████████████	████████████████	████████████████	████████████████	████████████████
CORNERING ABILITY	████████	████████	████████	████████	████████
BUMP AND JUMP HANDLING	████████	████████	████████	████████	████████
DURABILITY	████████	████████	████████	████████	████████
RADAR TESTED TOP SPEED	30 MPH*	BEST BUYER	All monster truck fans, but especially those looking for less complexity, noise and mess.		

\* Top speed varies with equipment used.

## SOURCES

**DURATRAX** distributed by Great Planes Model Distributors [duratrax.com](http://duratrax.com).

**FUTABA** distributed exclusively by Great Planes Model Distributors [futaba-rc.com](http://futaba-rc.com).

**GREAT PLANES MODEL DISTRIBUTORS** (217) 398-6300; (800) 682-8948; [greatplanes.com](http://greatplanes.com).

**KYOSHO** distributed by Great Planes Model Distributors [kyosho.com](http://kyosho.com).

**TRAXXAS CORP.** (888) 872-9972; (972) 265-8000; [traxxas.com](http://traxxas.com).

## LIKES

- > Non-stop wheelies.
- > Uses most aftermarket parts designed for the Mad Force.
- > Fast!

## DISLIKES

- > Most expensive car in its class.
- > Radio compartment prevents cooling air from reaching the ESC.

## TEST GEAR



## Traxxas EVX ESC

Novak builds the EVX for Traxxas, and it's at the top of just about every dual-motor trucker's wish list (and standard equipment on the E-Maxx). It's capable of handling dual battery packs (6 or 7 cells) and a pair of motors down to 19 turns, so it's perfect for the Twin Force. Novak's One-Touch setup, Polar Drive circuitry, "Smart Braking" and thermal shutdown technology are standard, and you can choose from 3 operation modes: Normal (forward, brake and reverse), Racing (forward and brake only) and, for you boat guys, Marine (forward and 20% reverse throttle).

Additional items used to complete the Kyosho Twin Force:



## Futaba 2PHKA transmitter

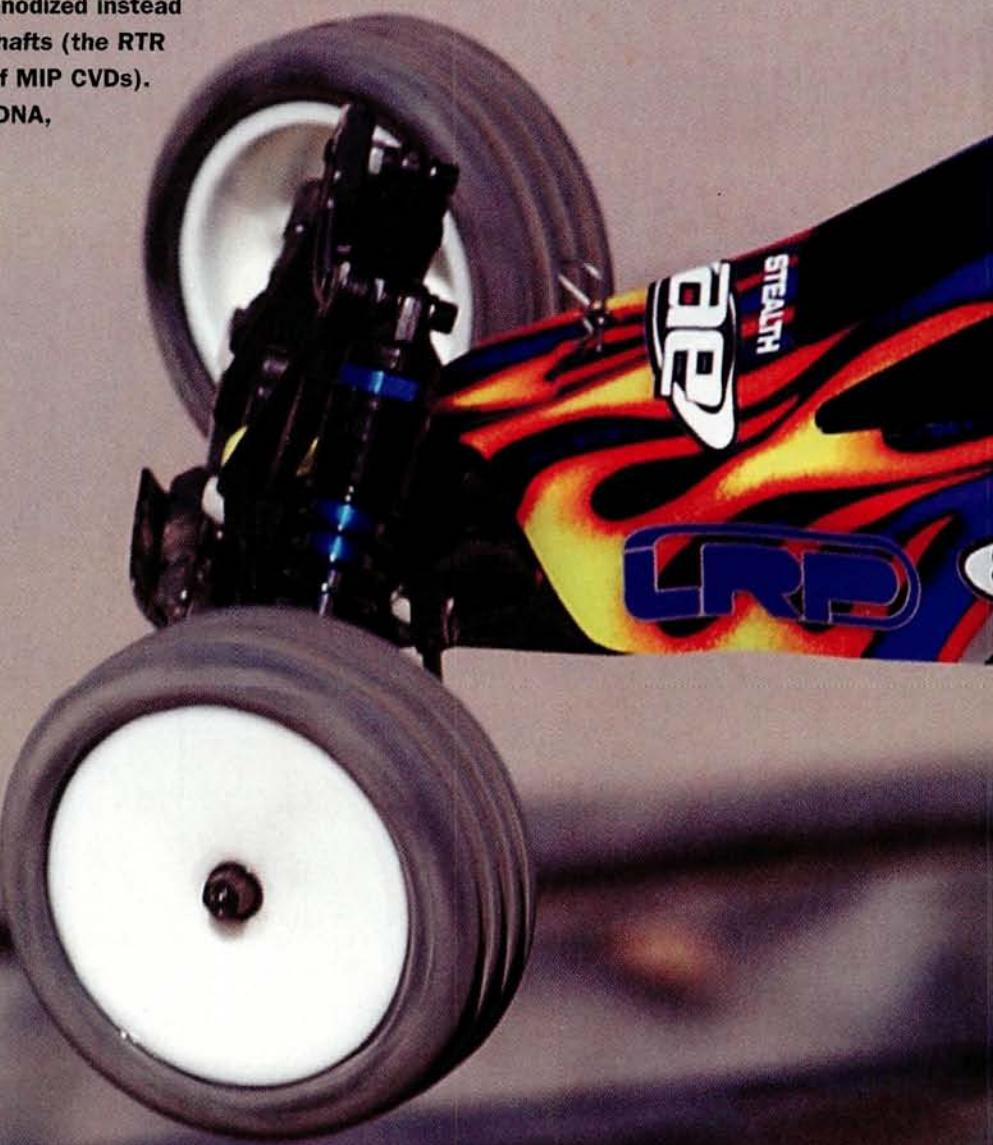
## Futaba S9450 steering servo

## Duratrax 3300 NiMH battery packs

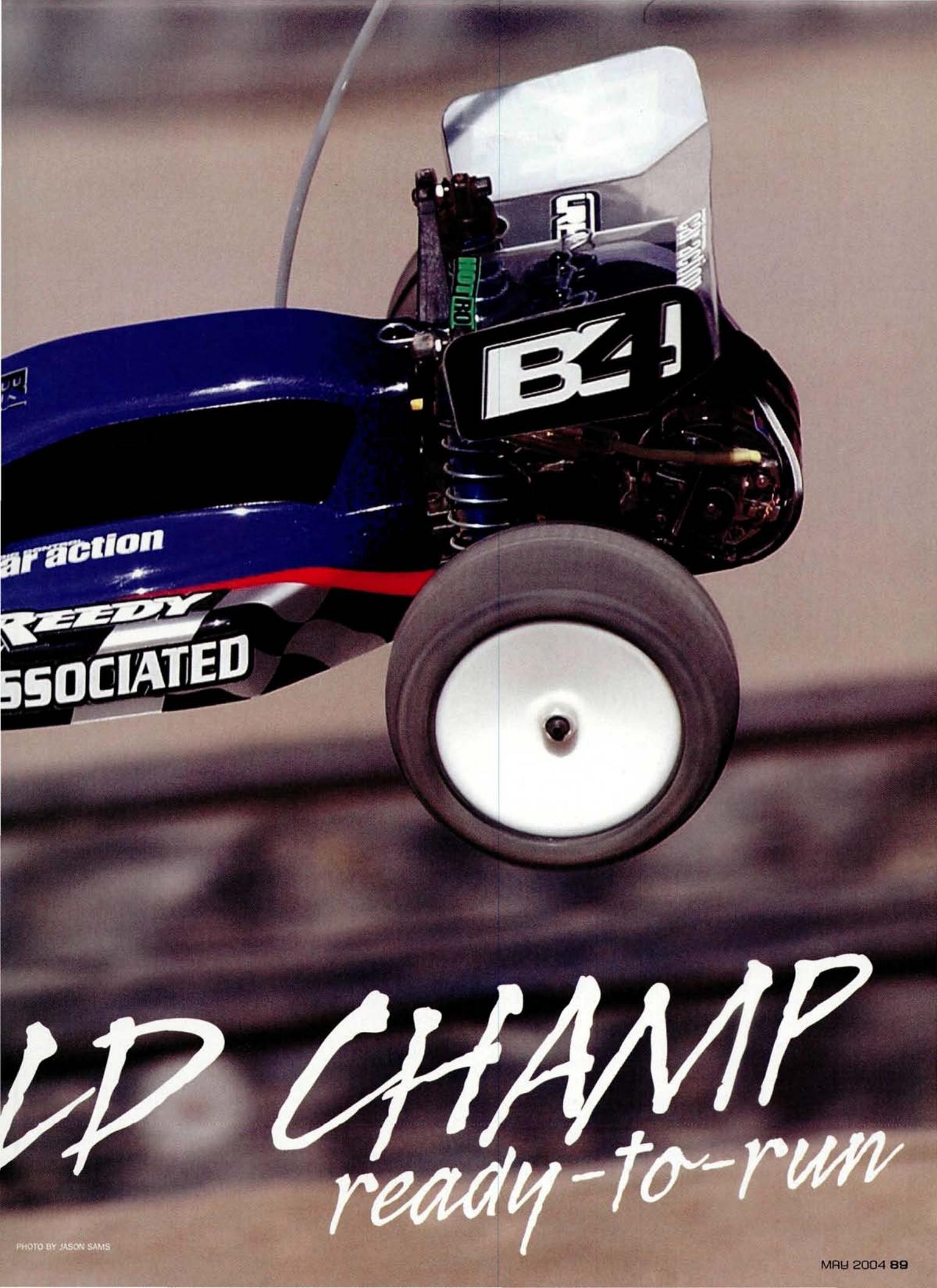


# Team Associated B4 RTR

**WHENEVER AN RTR VERSION OF A POPULAR KIT CAR ARRIVES**, the big question is, "What's different on the RTR?" In the case of Associated's B4 RTR, the answer is "not much." All the molded parts, gearbox internals and hardware are the same made-in-the-USA pieces as Associated polybags in its B4 kits, so you get all the latest B4 features. From its bearings and turnbuckles to its angled bellcranks and oversize diff, the B4 RTR matches the kit car. The only notable differences are the shock bodies (still aluminum, but blue-anodized instead of hard-anodized) and the drive shafts (the RTR uses floating dogbones instead of MIP CVDs). With that much world-champion DNA, the B4 RTR has gotta be good. How good? Let's drive.



WORK



ED CHAMP  
ready-to-run

## KIT FEATURES

**CHASSIS.** The B4's molded, composite-plastic chassis is exactly the same one as that in the B4 racing kit, and it has all the current racing features: central battery tray, kicked-up sides (for cornering clearance) and modular construction. The front and rear suspensions can be removed intact, and the transmission can be removed without disturbing the suspension. Steering-servo access is excellent, and the chassis is very stiff, despite its spacious layout with a few stiffening ribs. There's plenty of space for the included LRP speed control and Airtronics radio gear.

**DRIVE TRAIN.** The most notable feature of the B4's drive train is its larger differential gear (52 teeth versus the B3's 48), which was lifted from the RC10GT nitro truck. The larger gear accepts larger rings, and that helps the diff hold its settings more consistently and handle higher loads. The new diff also changes the transmission ratio to 2.6:1 for improved acceleration, so you can take better advantage of low-turn modified motors when you're ready for more power.

The slipper-clutch assembly is also new and improved. Instead of using just one slipper pad, the new unit uses two octagonal pads that seat directly into the sides of the spur gear. The dual pads have much more surface area than the old single-pad setup, and the new clutch has buttery-smooth slip action when needed.

The drive axles are one of the few areas in which the RTR B4 differs from the kit. Instead of using MIP CVDs, the RTR uses steel dogbones to transfer the tranny's spin to the rear wheels. Ironically, some of Associated's team drivers actually prefer the dogbones for certain tracks because they feel they increase traction. CVDs are still best for general racing, but you'll never miss them or universal-joint axles when you play with the B4.

**SUSPENSION AND STEERING.** Associated's "shocks behind the shock tower," front-end concept first appeared on Masami Hirosaka's "Stealth" prototype more than 10 years ago and is at last here in production form on the B4. The design moves the shocks farther back on the arms and lowers them in relation to the chassis to reduce the car's center of gravity (CG). The rear suspension has low-CG touches of its own, but they're more discreet. Shorter rear shocks are used (compared with the B3's), and the arms hang low for drive-shaft clearance and then kick up to meet the hub carriers. The shocks have the same construction as the kit B4's units, but they're blue-anodized aluminum instead of hard-anodized. They're topped by plastic, bladder-less caps and use clip-on spacers for adjusting ride height and preload. Camber and front toe-in are adjustable via steel turnbuckles, and roll center can be adjusted by stacking washers under the camber links' vertical inboard ball studs, or by moving the ball studs to other mounting positions.

The B4's dual-bellcrank steering system with integrated servo-saver is much like any other bellcrank system, except that the bellcranks' pivot posts are angled backward to match the steering arms' caster angle instead of being mounted perpendicular to the chassis. This eliminates bump-steer and helps the B4 remain stable through bumpy sections and on landing. The steering arms' trailing axles also help stability.

**BODY, WHEELS AND TIRES.** The B4 RTR's body stands out with its factory flame and checker paint job, but the wing is left clear. Both are fully trimmed and mounted for you and need only the finishing touch of a few decals (included). The front and rear wheels are standard, 2.2-inch, white, dish-style racing wheels. The front tires' wide four-rib design promotes aggressive steering; the rear tires have outer mini-pins and small inner lugs that work well on most unprepared surfaces. The compound is firmer than pure racing rubber, and that will help the B4 last through pavement bash sessions with its knobs intact. Foam inserts support the tires, which are well glued at the factory.

## INCLUDED ELECTRONICS &amp; ACCESSORIES



## AIRTRONICS BLAZER SPORT 27MHZ RADIO

The Airtronics Blazer Sport radio system has a nice ergonomic feel and excellent range. The usual trim knobs and reversing switches are in place, and dual-rate steering is now standard. That's a must-have for a capable buggy such as the B4. The 3-LED battery meter is another welcome feature. It's much easier to judge battery life with this setup than with a single LED.

## LRP RUNNER ESC

The Runner doesn't have an on/off switch, so the car is "live" the moment you plug in a charged battery. Always turn the radio on first before you plug in the battery. The ESC has forward and reverse, which is great for play, but there's no brake or reverse-lockout function. That makes the Runner incompatible with racing (where reverse isn't allowed). That's a bummer, since the B4 is otherwise race-ready.

## TEAM ASSOCIATED 17-TURN MODIFIED MOTOR

The included 17-turn machine-wound modified motor provides plenty of power. The motor is noticeably faster than a stock 27-turn, and its armature spins on bushings and uses replaceable stand-up-style copper brushes.

## AIRTRONICS 94102 STEERING SERVO

Airtronics' 94102 is the standard heavy-duty servo used in many of today's RTR vehicles because of its durability. According to Airtronics, it produces 53 oz.-in. of torque and has a transit speed of 0.16 second with 6 volts of power.

## TOOLS &amp; OTHER COOL STUFF

Associated supplies four hex-wrenches and three plastic wrenches that will let you tear down the entire car. Several preload spacers of different sizes allow you to alter the buggy's ride height, and a dense-foam battery spacer makes fore/aft battery positioning possible. A detailed manual with CAD illustrations, setup tips and a "Quick Start" guide will make operating and maintaining the B4 easy.

## you'll need

- 6-cell battery w/ Tamiya connector
- 8 AA batteries
- Battery charger

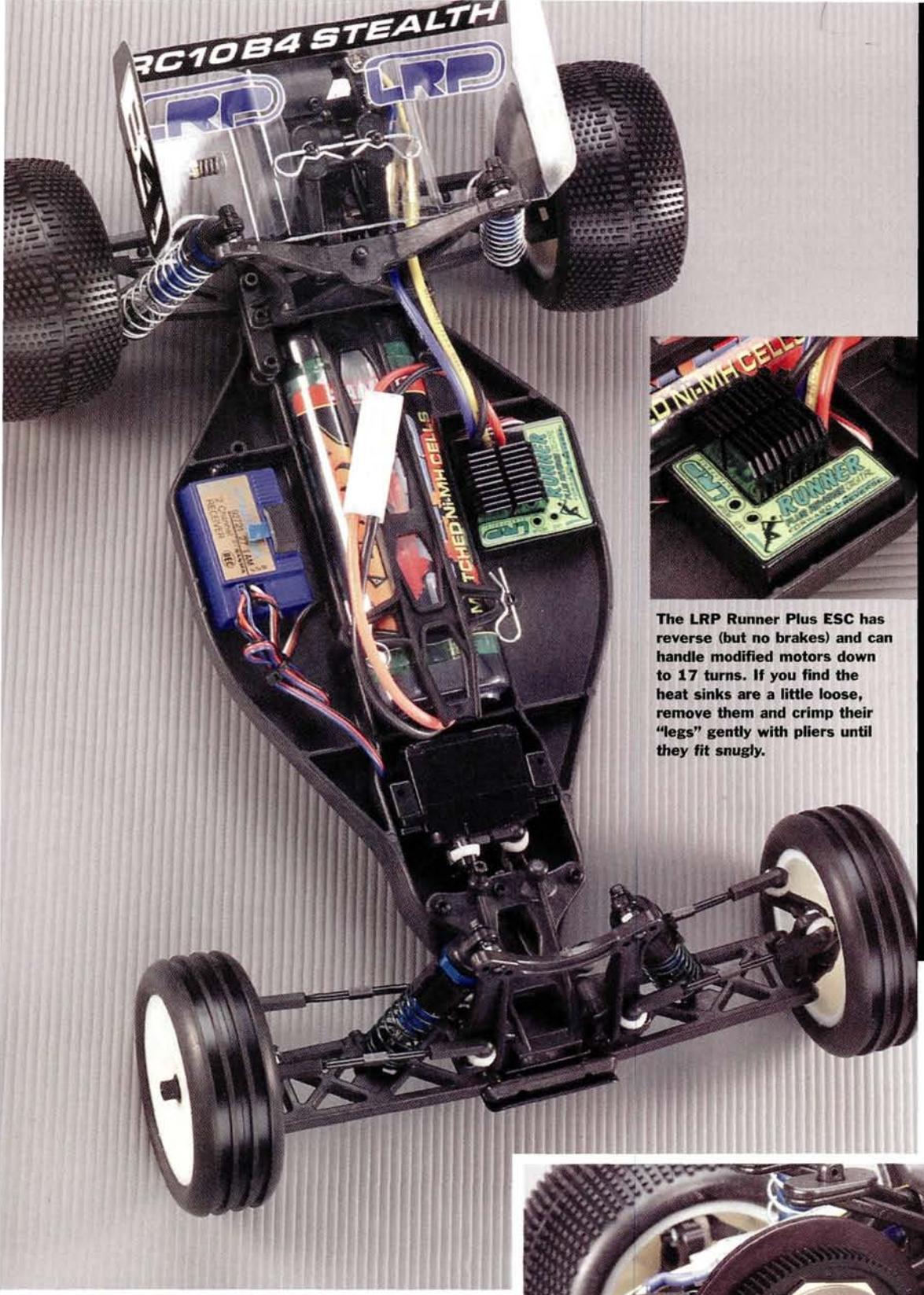
## factory options

- Blue, titanium 2-in. turnbuckles (pair)—item no. 1406
- Rear swaybar set (includes 3 bars)—9635
- Blue-anodized aluminum shock caps (4)—1598
- Lightweight diff-outdrive set—1766
- Steering-rack bearings (4)—3971
- Unobtanium low-friction shock shafts (F/R)—6418/6417
- Caster blocks—9592 (20 deg.)/9593 (30 deg.)
- Complete molded-graphite parts set—9655
- In-line steering blocks (pair)—9577

## FACTORY TEAM ALUMINUM

- Motor plate—9600B
- Wheel spacer—9608B
- Hinge-pin brace—9616
- In-line axle—9623

Partial list; more options are available.



The front shocks are mounted behind the shock tower to lower the B4's CG; this moves the camber links to the front of the shock tower. Trailing axles are standard; optional in-line axles are available to make the steering feel more aggressive.

## SPECIFICATIONS

**MANUFACTURER** Team Associated  
**MODEL** B4 RTR  
**DISTRIBUTED BY** Team Associated  
**SCALE**  $\frac{1}{10}$   
**PRICE** \$250  
*(Varies with dealer)*

### DIMENSIONS

**Wheelbase** 10.72 in. (272mm)  
**Width** 9.9 in. (251mm)

### WEIGHT

**Total, as tested w/battery**  
55.73 oz. (1,580g)

### CHASSIS

**Type** Molded semi-tub  
**Material** Composite plastic

### DRIVE TRAIN

**Type** 3-gear transmission  
**Primary** 23/81-tooth spur gear  
**Transmission ratio** 2.6:1  
**Final drive ratio** 9.16:1  
**Drive shafts (R)** Dogbones  
**Differentials** Ball-type with steel outdrives  
**Bearing type** Rubber-sealed

### SUSPENSION (F/R)

**Type** Lower H-arm with turnbuckle camber link  
**Shocks** Blue-anodized, aluminum-body oil-filled with clip-on preload spacers

### WHEELS

**Type** 2.2-in. one-piece, dish-style plastic

### TIRES

**Type** Wide-body 4-rib, mini-pin style with central mini-lugs

The B4's dual-pad slipper is finely adjustable and super-slick. Steel turnbuckles and blue-anodized shocks are standard.



## PERFORMANCE

Given its world champ status, I decided to head out to my local track to see how well the B4 RTR would hold up over the bumps, jumps and turns of a technical track. I didn't touch the buggy's out-of-box setup because I don't think many of you will either. I charged a few Reedy Rated-X 3300mAh packs and was all set to put in some practice time. The LRP Runner ESC doesn't require setup; in fact, you don't even switch it on. Just plug in the pack, and it's on—so make sure that you turn the radio on before you plug in the ESC.

The track surface was hard-packed and slightly dusty, so I knew rear traction would be a little loose. The B4 seemed slightly undergeared because it reached its top speed only a third of the way along the straightaway. I ran the pack until it died, and the buggy felt quite composed and hooked up. The rear end swung around a little in the fast corners, but that wasn't much of a concern, since the track was dusty.

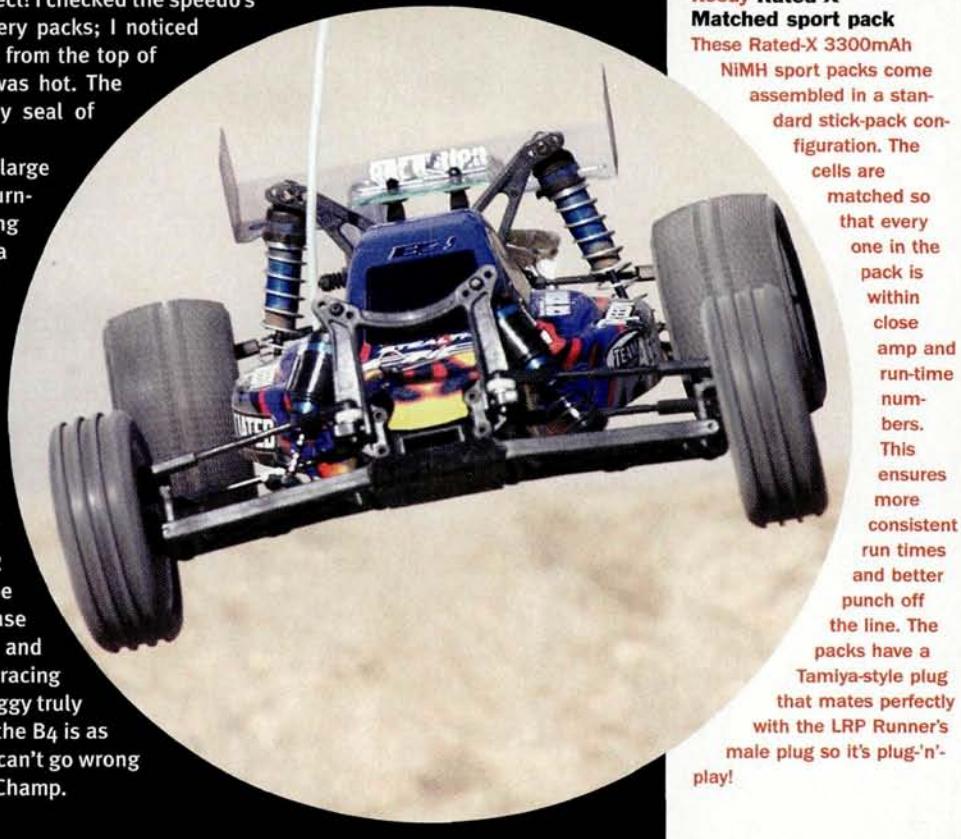
It took me a while to get used to the speed control's instant reverse (there's no brake). I'm used to having brakes, and I found that letting off on the throttle for corners was better than tapping reverse to slow down. When I went into a turn too hot and instinctively grabbed up-trigger, the B4 usually did a "Starsky and Hutch" reverse 360. Reverse came in handy, however, when I got the buggy stuck against the track's outside barriers. I just backed it up, and off it went.

For my next pack, I decided to go up one tooth on the pinion gear. The buggy was definitely faster going down the straightaway, and the bottom-end punch was still there. I noted that the B4 RTR's initial steering response was fast and crisp, but it had significant on-power push when exiting corners. I thought that the stock steering servo was the culprit but found that adding front toe-in solved the problem. Over the jumps, the buggy really shone. It didn't bottom out over the small jumps, and even after landing a little funny off the large jumps, it didn't get out of shape but tracked absolutely straight. While airborne, the buggy tended to fly with its nose down, which was perfect for down-siding doubles. Most RTR suspensions are set up too soft, in my opinion, but not the B4 RTR's; its suspension was perfect! I checked the speedo's temperature after running two consecutive battery packs; I noticed that one of the four heat sinks had been ejected from the top of the unit. I touched the unit to see whether it was hot. The speedo was merely warm; it definitely gets my seal of approval.

On my final pack on the track, I ended on the large tabletop and managed to break a front steel turnbuckle. The crash was pretty gnarly, so something had to give. For a couple of bucks, I purchased a new set of turnbuckles, so now I have spares. Although I tested the B4 RTR at my local track, it also works great when you jump curbs, roost dirt in your backyard and tear up the neighborhood. It's a really fun buggy to bash around the block.

## THE VERDICT

You don't even need to open the box to see how good the B4 RTR looks; you can glimpse one of the nicest paint schemes ever to grace an RTR through the box's plastic window. And you won't be disappointed after you've opened the box because the buggy's blue-anodized shocks, racing tires and ultra-low stance scream "fast" and "sleek." The racing features work together on the track, where the buggy truly shines. With the exception of the no-brakes ESC, the B4 is as race-ready as RTRs get. For about 250 bucks, you can't go wrong with this incarnation of the current IFMAR World Champ.



## LIKES

- Excellent handling right out of the box.
- The body, shocks and wheels make the B4 RTR one hell of a looker.
- A motor swap is all that's needed for this buggy to be raceworthy.

## DISLIKES

- No on/off switch on ESC.
- An ESC heat sink popped off easily.

## TEST GEAR



### Reedy Rated-X Matched sport pack

These Rated-X 3300mAh NiMH sport packs come assembled in a standard stick-pack configuration. The cells are matched so that every one in the pack is within close amp and run-time numbers. This ensures more consistent run times and better punch off the line. The packs have a Tamiya-style plug that mates perfectly with the LRP Runner's male plug so it's plug-'n'-play!

## SOURCES

**AIRTRONICS** (714) 978-1895; [airtronics.net](http://airtronics.net).

**LRP** distributed by Team Associated (714) 850-9342; [teamassociated.com](http://teamassociated.com).

**REEDY**, a division of Team Associated (714) 850-9342; [teamassociated.com](http://teamassociated.com).

**TEAM ASSOCIATED** (714) 850-9342; [teamassociated.com](http://teamassociated.com); [rc10.com](http://rc10.com).

## RATING THE TEAM ASSOCIATED B4 RTR

	POOR	FAIR	GOOD	VERY GOOD	EXCELLENT
INSTRUCTIONS					
INCLUDED ELECTRONICS					
PARTS FIT & FINISH					
ACCELERATION					
CORNERING ABILITY					
BUMP & JUMP HANDLING					
DURABILITY					

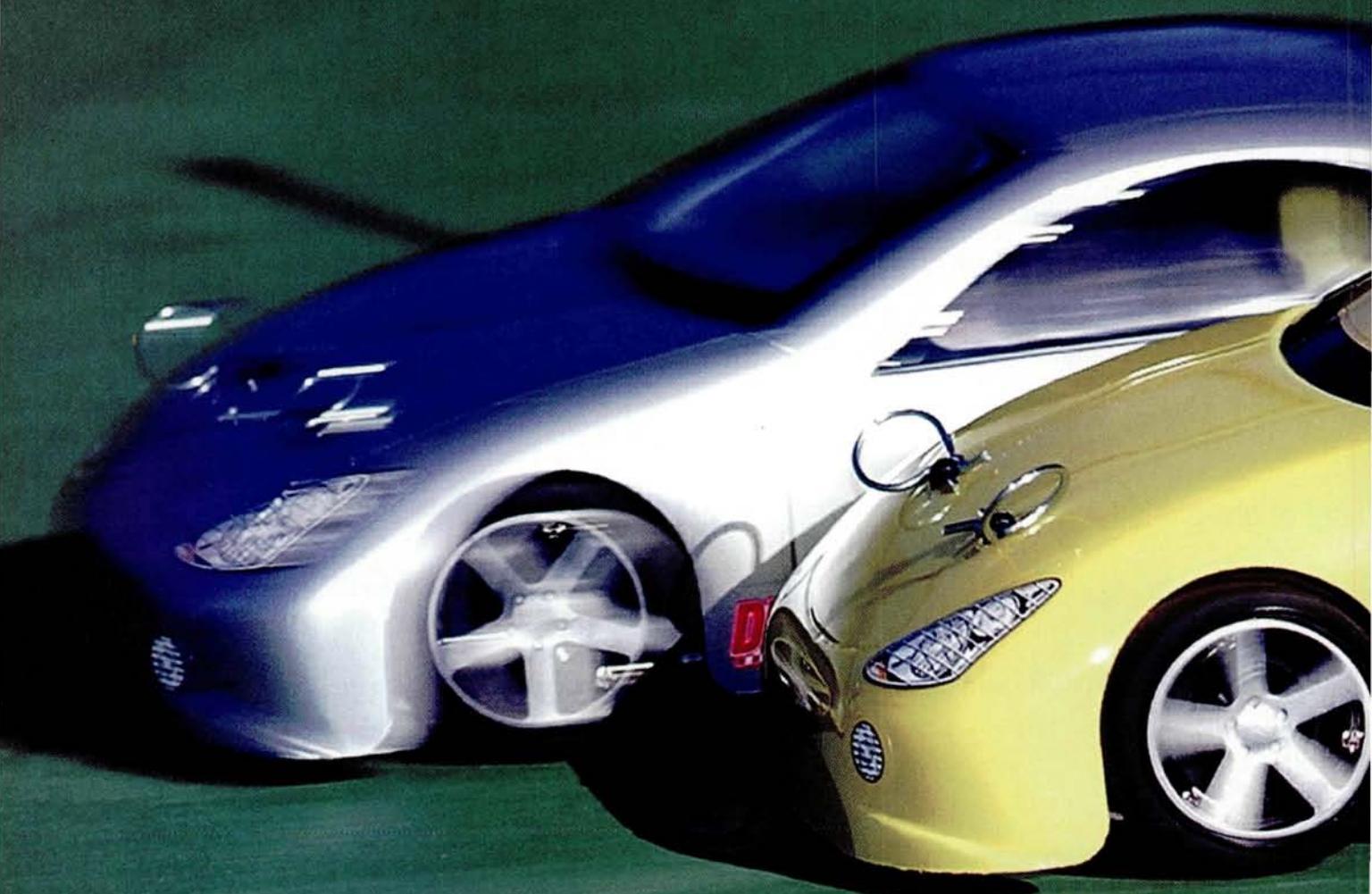
RADAR-TESTED TOP SPEED

24MPH\*

BEST BUYER

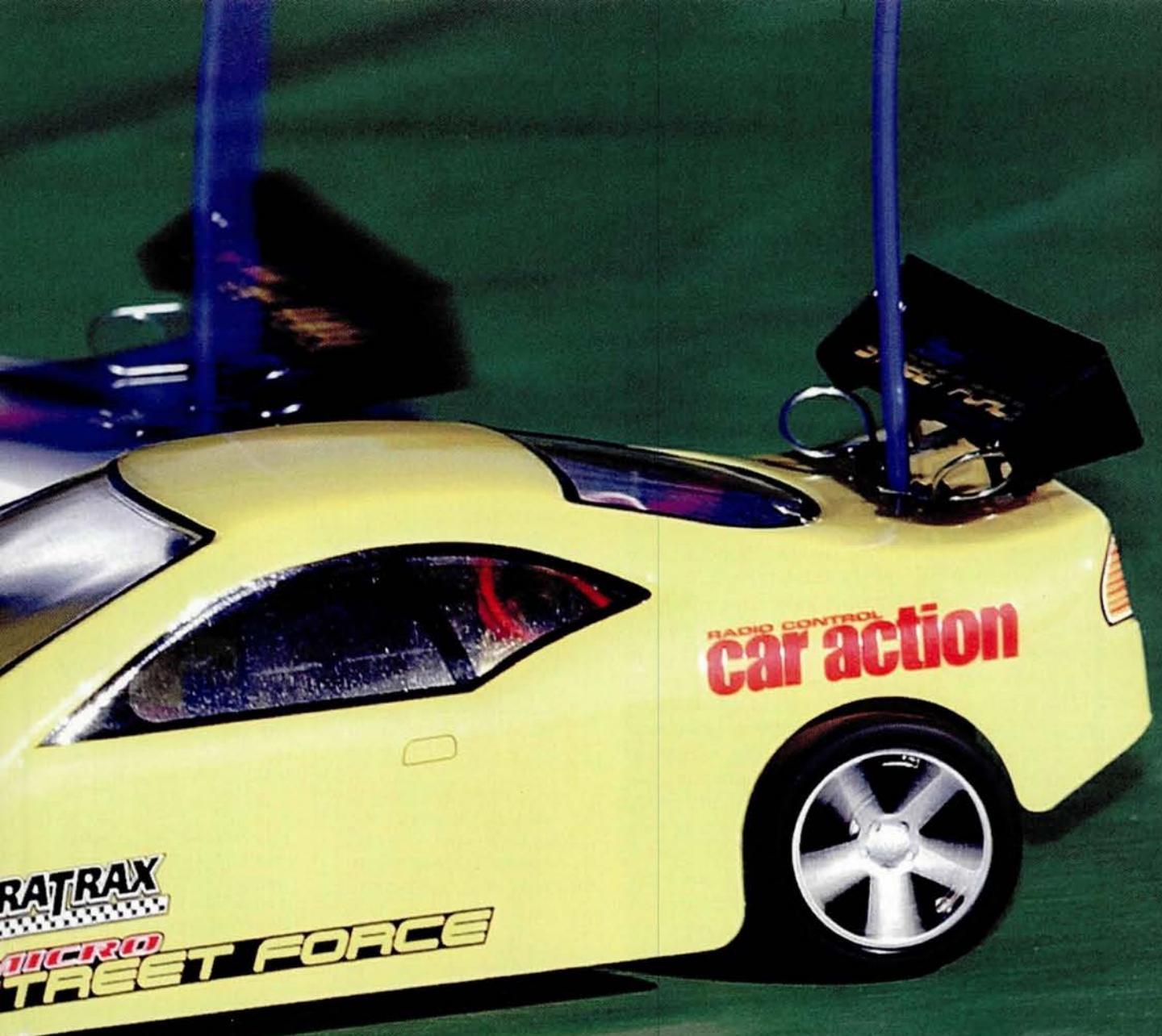
All RC drivers, but especially future racers.





## DuraTrax Micro Street Force

DuraTrax is the latest to join the microcar crowd with the new Micro Street Force, an  $\frac{1}{18}$ -scale ride that combines pan-car-style direct drive and a solid rear axle with an independent front suspension and belt-driven front differential (much like HPI's Micro RS4 design). Like all DuraTrax cars, the Micro Street Force is an impressively complete RTR. The body is painted, alkaline batteries are supplied for the Futaba-built transmitter and a rechargeable battery and wall charger are included; all you have to do is slip in the batteries, charge it up and hit the street. And after cracking open the box, hitting the pavement is exactly what I did. Wanna know if the Micro Street Force can keep up with all of the other small fries of RC? Start flipping the pages and find out.



**STREET-READY  
MICRO RACER**

**KIT FEATURES**

**CHASSIS.** The Street Force chassis consists of two, black fiberglass plates. The lower plate is nicely hollowed out at the back to allow the rear end to flex so the Force can get some bite, and the underside is fully countersunk to prevent the heads of screws from grabbing the ground and slowing the car. The upper plate adds stiffness to the front end and makes a nice "cradle" to hold the battery. A "trap door" setup in the upper plate makes battery changes easy—all you gotta do is pull one body pin. Set up hump-pack style, the batteries fit through the upper deck and sit in-line with the chassis. It's a simple and effective system that works very well. Up front, the foam front bumper helps protect things when the inevitable crashes happen.

**DRIVE TRAIN.** The Micro Street Force is powered by a 180 motor; it's the same size used by HPI's Micro RS4. That's good news; it means the after-market motors offered for the RS4 will fit the Street Force as well. The motor spins the solid rear axle direct-drive style, and a gear differential is built into the spur gear. The gear also has an integrated pulley. A drive belt is looped around the diff; it reaches up to the front of the chassis and grabs the front differential pulley. The front gear diff is beefy and quite smooth; no doubt, because of the large plastic bevels inside. Two cute (yes, I said cute), tiny plastic universals send the diff's spin to the front wheels. All the parts run on metal-shielded bearings, and the drive train feels very slick overall.

**SUSPENSION AND STEERING.** The Street Force relies on chassis flex for its rear suspension. Although it isn't as sexy as a completely independent setup, it does get the job done in the limited space provided. A single friction coil-over shock helps control pod movement. Even though it isn't fluid filled, it can be tuned by using different viscosities of silicone fluid on the shaft to control damping. Up front, the suspension is more trick. Fixed lower A-arms with sliding knuckles are attached to the upper A-arms, which actuate inboard, laydown shocks. Not only does it look cool, but to change springs at the track involves little more than removing a screw. Nice! Like the rear shock, the front friction shocks can be tuned with different lubes. As for steering, the servo is attached to the front wheels via a split "U"-shaped slider. It does appear to give some bump-steer when the front end is compressed, but it's really nothing to worry about.

**BODY, WHEELS AND TIRES.** DuraTrax does all the work for you when it comes to painting the shell and trimming the body. The included body looks like a cross between an Acura RSX and a Pontiac Sunfire, and you can choose from black, blue, red, white, silver and yellow—one color for each of the six 27MHz frequencies. Although it's light on detail and doesn't really look like any "real" car, the Force is plenty tough, as I can attest! An injection-molded wing finishes off the body with functional street style. Because of my driving style (that would be upside-down sliding into things), I prefer the Street Force's plastic wings instead of Lexan ones; they tend to hold up much better. After you've beat up the stock body, you can change your Street Force's look with one of the many 150mm wheelbase  $\frac{1}{18}$ -scale shells from HPI, Pro-Line and others.

The Force's two-piece wheels allow width adjustment so the chassis will fit under a variety of body shells; the adjustability is also a useful tuning aid. Each outer rim is firmly held to the inner rim by three screws that fit into "steps" (three sets front and four sets rear), and each "step" alters

the wheel's offset by about  $\frac{1}{16}$  inch. Since black plastic and screws don't look all that cool, DuraTrax includes attractive 5-spoke, snap-in hub caps to pull the whole look of the wheels together. Gummy slicks have been factory glued to the wheels, and foam inserts that are just a little thicker than servo tape support the rubber.

**INCLUDED ELECTRONICS & ACCESSORIES****DURATRAX BY FUTABA RADIO GEAR**

The DuraTrax transmitter's servo-reversing, steering and throttle trim and a charging jack for an optional Ni-Cd pack are expected, but steering dual rate is a bonus.

The 27MHz DuraTrax RX-100 receiver does a fine job of grabbing the signal, and since everything is made by Futaba, these are high-quality pieces.

**DURATRAX SX100 STEERING SERVO**

In a car this small, the full-size DuraTrax SX-100 servo has far more torque (about 40 oz.-in.) and durability than any microcar will ever need.

**DURATRAX ESC 1000**

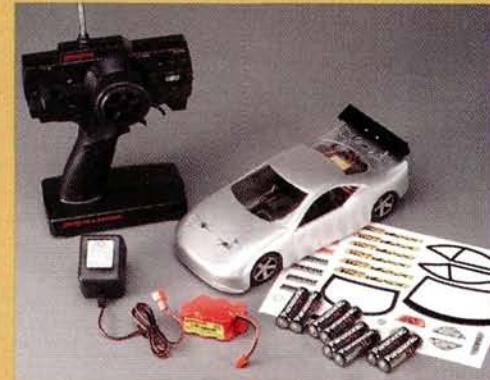
Replaceable power wires, smooth acceleration, reverse with a three-second delay and strong brakes all made it into this ESC. Add the ability to handle 4 to 6 cells and up to 10 amps, and you'll see why it's completely unnecessary to upgrade this baby.

**180 MOTOR**

The included 180 motor is a basic micro motor; it's the equivalent of what you'd find in an HPI Micro RS4. It isn't a powerhouse, but the included 6-cell battery pack gives it a lot more rip than standard 180 motors in 4- or 5-cell cars.

**RECHARGEABLE BATTERY AND WALL CHARGER**

Street Force includes a Ni-Cd pack for more punch and run-and-recharge convenience. The pack



holds only 600mAh, but run times are still lengthy, and you get a full 7.2 volts of power. A wall charger is included to juice it up, but get ready for a lot of PlayStation time between runs; it takes three hours to trickle-charge the pack.

**TOOLS AND ACCESSORIES**

The Micro Street Force includes complete build-up and teardown instructions. You also get 9-, 11-, and 13-tooth pinions, a battery box to run the car on 4 AA alkaline cells and 8 AA alkalines for the transmitter. What else do you need to buy? Nothing.

**you'll need**

- No additional items required!

**factory options\***

- Titanium rear axle—item no. DTXC6178
- Graphite upper plate—DTXC7035
- Aluminum upper-plate mounts—DTXC7036
- Graphite chassis V-type—DTXC7038
- Aluminum CV shafts—DTXC7279
- Front one-way differential—DTXC7425
- Heat-sink motor plate—DTXC8276

\*partial list; additional options available

**THE COMPETITION**

	SCALE	DRIVE TRAIN	KIT/RTR	RADIO	BODY	ESC*	PRICE**	REVIEWED
DuraTrax Micro Street Force	$\frac{1}{18}$	4WD belt	RTR	DuraTrax by Futaba	Painted Lexan	F/B/R	\$190	5/04
HPI Micro RS4 RTR	$\frac{1}{18}$	4WD belt	RTR	HPI	Painted Lexan	F/B/R	\$210	1/02
Kyosho Mini-Z MR-02	$\frac{1}{28}$	2WD	RTR	Kyosho Perfex KT-5	Painted "hard" body	F/B/R	\$160	12/03
XRAY M-18	$\frac{1}{18}$	4WD shaft	Kit	Not included	Clear Lexan	Not included	\$110	3/04

\*Forward/brake/reverse \*\*Approximate; price varies with dealer

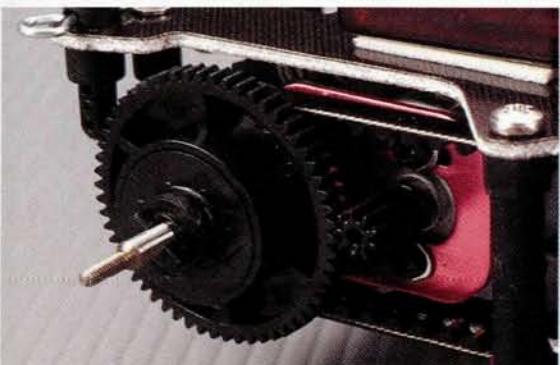


The DuraTrax receiver dwarfs the tiny ESC. It isn't that the receiver is big, it's just that the ESC is so small!



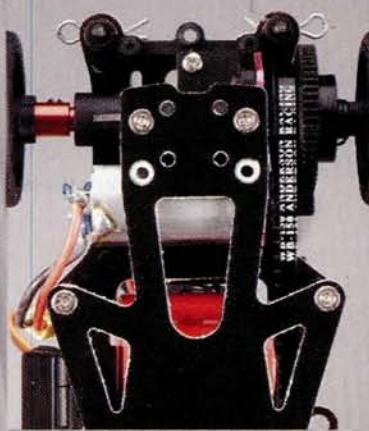
My favorite feature: pull one pin to swap your battery pack. Everything should be this easy!

Check out the innovative inboard shock setup. Even though it is pretty sophisticated, changing springs requires little more than removing a screw. The nice foam bumper will help with those off-course "incidents."



**Left:** although not as smooth as a ball diff, the included gear diff is bullet-proof and allows some adjustment. It's also a snap to change the plastic pinions.

**Right:** smooth-running bearings, robust A-arm suspension and a full-size servo ensure that you'll spend very little bench time wrenching on broken parts.



Since chassis flex is what the Street Force uses for rear suspension, that big cutout means that traction should be easy to find.

## SPECIFICATIONS

**MANUFACTURER** DuraTrax  
**MODEL** Micro Street Force  
**DISTRIBUTED BY** Great Planes  
 Model Distributors  
**SCALE** 1/18  
**PRICE** \$180  
 (varies with dealer)

## DIMENSIONS

**Wheelbase** 5.5 or 5.9 in.  
 (140mm or 150mm)  
**Width (F/R)** 3.5 to 3.9 in. (88.9 to 99mm)/4 to 4.4 in. (101.6 to 111mm)

## WEIGHT

Total, as tested 14.2 oz (402.6g)

## CHASSIS

Type Double deck  
 Material Fiberglass plate

## DRIVE TRAIN

Type Single belt 4WD, front/rear diffs  
**Drive shafts (F/R)** Plastic universals/Pan-car-style axle  
**Differentials** Plastic bevel gear  
**Bearings** Metal-shielded ball bearings

## SUSPENSION

Type (F/R) Independent upper and lower A-arm/flex plate  
**Shocks (F/R)** Plastic friction shocks

## WHEELS

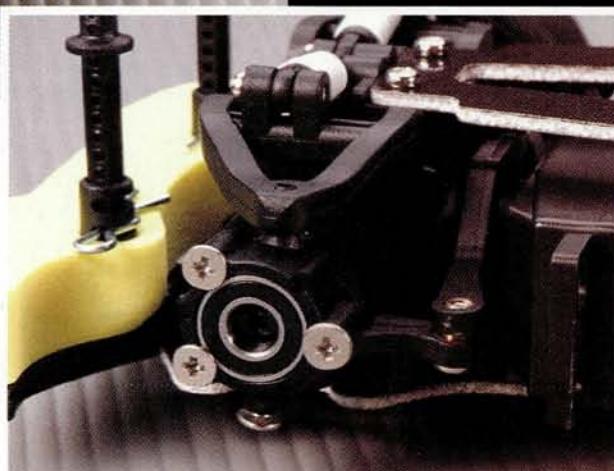
Type 2 piece, adjustable width

## TIRES

Type Soft rubber slicks with foam liners

## ELECTRONICS

**Radio** DuraTrax  
**ESC** DuraTrax reversing  
**Motor** 180 type  
**Battery** DuraTrax 600mAh



## PERFORMANCE

The Street Force comes with a three-hour wall charger for the onboard battery, but since I was in a hurry, I used my Reedy Quasar Pro to juice up the pack instead. I ran downstairs to try the Street Force in my driveway. The car had some decent zip, but what really impressed me was how it handled the bigger bumps. I thought for sure that the poor little Micro Force would end up on its lid a bunch of times, but instead, it just hopped right along and kept on rolling. I could even slide it on the dirty parts of the tar and had my own mini rally going on! Of course, where there are bumps, there are jumps; I must admit that the Street Force did spend some time in the air. But it didn't complain; the car just kept right on going. This all went on for more than 20 minutes, an especially impressive run time when you consider the included pack holds just 600mAh. The only sign of any damage was that the front springs seemed to droop a bit, and that was probably more because of my "driving style" than anything else.

I was curious to see whether the little car had any race potential in its stock form, so I grabbed some TRC foams and headed over to Radical Rick's Race City in Swansea, MA, to try out the new carpet roadcourse. After installing a freshly charged pack and switching out the factory-installed 9-tooth pinion for the included 13-tooth gear, I hit the carpet. Acceleration wasn't as crisp as before (because of the gear-up), but on a track designed for  $\frac{1}{10}$ -scale cars I didn't have to lift off the throttle very much with the little Street Force, and the speed increase from the different pinion was quite noticeable.

Handling was also excellent; the suspension only got choppy when the car was tossed full tilt into really sharp turns. Speaking of sharp turns, I overcooked a tight kink and clipped a corner dot after a long, full-throttle straight and sent the poor DuraTrax Micro tumbling over the boards and out of the track. I walked to what I thought would be a twisted mess, but the only problem was that one of the upper front suspension hinge pins had backed out. After finding the pin, I reinstalled it and put a small dab of CA on both pins to prevent them from coming out again. I finished off the pack, and although the pinion swap did increase speed, it did so at the expense of run time. Total run time was cut down by a few minutes; at worst, I'd say it got 15 minutes out of the pack. That's still very good—especially when compared with the time I'd get running a  $\frac{1}{10}$ -scale touring car.

## VERDICT

DuraTrax's Micro Street Force has proven itself to be quite fun and is a tough little car to boot. That it comes completely built with everything you need, including the transmitter batteries and wall charger for the 6-cell pack, means there is very little downtime between leaving the hobby shop and hitting the driveway—just charge the batteries and go. It handles well, is as fast (or faster) than the other cars in its class, and if you're looking for more speed, you can always dip into DuraTrax's long list of available hop-ups to further increase the Micro Street Force's performance.



### RATING THE DURATRAX MICRO STREET FORCE

	POOR	FAIR	GOOD	VERY GOOD	EXCELLENT	LIKES
INSTRUCTIONS	████████	████████	████████	████████	████████	> Handles well. > Tough. > Excellent battery access. > Good hop-up potential.
INCLUDED ELECTRONICS	████████	████████	████████	████████	████████	You get Futaba's high quality and durability, and the ESC is plenty small!
PARTS FIT AND FINISH	████████	████████	████████	████████	████	The front hinge pins could be a little more snug; otherwise, the Street Force is well built.
CORNERING ABILITY	████████	████████	████████	████████	████	Plenty of grip and good stability for its size.
ACCELERATION	████████	████████	████████	████	████	Brisk, but speed demons will want more.
DURABILITY	████████	████████	████████	████████	████	Nothing broke, but the front springs did develop some droop.

RADAR TESTED TOP SPEED

14.5MPH\*

BEST BUYER

All RC drivers, but especially those looking for affordable, "indoor-able" action.

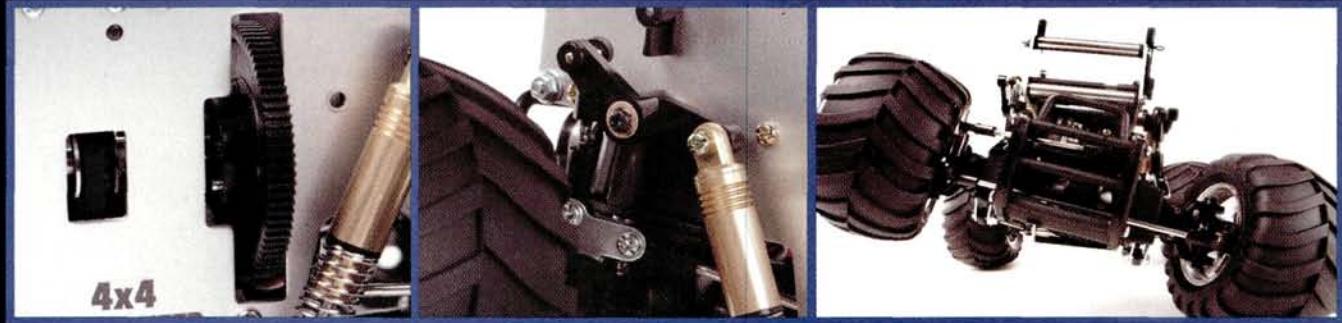
### DISLIKES

- > Front springs are a little soft for my taste.
- > The body is light on detail.

### SOURCES

DURATRAX distributed by Great Planes Model Distributors (217) 398-6300; (800) 682-8948; duratrax.com.

First of the new "Little Gear" series, Tamiya is proud to release the new 1/18 scale TLT-1 (Tamiya Little Truck) Rock Buster. Designed to use full-size R/C electronics, powered by a 540 motor, with 4-wheel drive, 4-wheel steering capability and multi-link cantilever suspension. The Rock Buster isn't your ordinary 1/18th scale vehicle. This monster is also equipped with four aluminum oil-filled dampers to handle any terrain, and an adjustable center differential for traction management and cornering similar to what's found on 1/8 nitro off-road buggies. The Rock Buster has more standard features than most 1/10 scale monster trucks. Being less than 30cm (1 foot) long, this truck can be as much fun in the house as it is outside. A lightweight durable polycarbonate body combined with loads of metal parts makes this little truck super tough. So get yours today at your local hobby source or visit [www.tamiyausa.com](http://www.tamiyausa.com) for more information.



The belt driven center drive-train makes 540 size power transfer extremely smooth and the standard pattern spur gear hub gives the TLT-1 gearing flexibility to suit any 540 motor.

The TLT-1's cantilever suspension is designed specifically for the small confines of the 1/18 scale TLT-1 while providing long stroke suspension and maximum axle articulation.

# Little Gear

**TLT-1 Battery Pack**  
Item 90492

**2mm Thick Aluminum Main Frame**

**Front & Rear Push Rod Type 4-Link Cantilever Suspension**

**Front & Rear Sealed Differential**

**Aluminum Oil-Filled Dampers**

**Semi-Pneumatic Tires**

**Metal Plated Wheel**

\*Tamiya TLT-1 Battery Pack and electronics sold separately.

# HORSEPOWER

## THE FIVE MOST POWERFUL ENGINES DYNOSTESTED

# 5

O.S. ENGINES  
.21 VZ-B

NOVAROSSI  
RS12 T5

TRAXXAS  
TRX 2.5



**WHAT DO RC RACERS AND BASHERS WANT MOST?** Power! Most nitro engines are very powerful, but that doesn't stop the power hungry from asking: which is the *most* powerful engine?

Our sister mag, *RC Nitro*, attempts to answer this pressing question in every issue. On a custom-built dynamometer, nitro engines are put through their paces. This guide shares that info with you. Here, we review the most powerful engines in each popular class of the small-block and big-block categories. Dyno-testing is time-consuming, so we haven't tested every available engine; there may be something more powerful out there, but this group represents the best of the best we've tested.

# HEAVEN!

by Steve Pond

photos by Deron Neblett

SIRIO  
S27XL RACER

SIRIO  
S15 5-PORT  
TURBO



## POWERFUL PARTICULARS

**H**ow can two engines look identical while one offers twice as much horsepower (or more) as the other?

The difference might be the result of the quality of the materials used and how they were machined. You can't see these, but high-quality materials and precise manufacturing are the foundations of all good engines and are common to all the engines featured here. Good engines have very precise tolerances and good-quality materials that have been selected for their suitability and not just to minimize manufacturing costs. The better materials can cost twice as much or more, but that's what you pay for when you buy a premium high-performance engine.

Port configuration and timing are the other big contributors to performance. Port position and the timing of when they open and close affect performance significantly. Manufacturers try to determine the most powerful setup for each engine; this takes time, and it's another reason that powerful racing engines usually cost more than sport engines.

## STARTING A HIGH-PERFORMANCE ENGINE



To make a new high-performance engine easier to start, warm it with a heat gun on the lowest setting or a good hair dryer on the hottest setting for a few minutes before you try to start it.

quality engine oil in the cylinder. Don't use more than a couple of drops, or you'll foul the plug. Then use a hair dryer to heat the engine before you attempt to start it. Most hair dryers won't get the engine hotter than about 200 degrees, so there's no risk of overheating it. You can also use a heat gun for this, but a heat gun can get much hotter, so be very careful to avoid overheating. If you heat the engine to 160 to 200 degrees, you will expand the top of the sleeve before you attempt to start the engine. The engine will be easier to turn over, and the piston will be less likely to get stuck in the now-expanded sleeve. So a couple of drops of oil, heat and patience are all you need to get these fire-breathers cranking'.

## WHAT IS HORSEPOWER?

**H**orsepower (hp) was defined by James Watt in the late 1700s after he had studied the horses used to pull coal at mines in England (yes, he's the reason we speak of 60-“watt” light bulbs, etc). Watt judged that these animals, pulling up buckets of coal, did about 33,000 pounds-feet of work in one minute. This is the same as moving 550 pounds 1 foot in 1 second ( $33,000 \div 60 = 550$ ). You can slice it any way you want; as long as it equals 33,000 pounds-feet per minute, you have 1hp.

$$hp = \frac{\text{Torque} \times \text{rpm}}{5,252}$$

A good example of horsepower is a comparison between a servo and an engine, both of which produce a similar amount of torque. An average engine has 100 oz.-in. of torque, and a good servo also has 100 oz.-in. of torque. The servo only spins at the equivalent of 1 revolution per second, where the engine does so at more than 433 revs per second ( $26,000 \text{ rpm} \div 60 \text{ seconds} = 433.33 \text{ revs per second}$ ). So, using the above equation to calculate horsepower, the engine is roughly 433 times more powerful than the servo, even though they have the same torque rating.

We test engines on a specially designed dynamometer; each is subjected to loads that mimic those encountered when installed in a car or truck. The resulting precise torque and rpm measurements are used to calculate horsepower. Corrections are made to account for variations in temperature and humidity, so the comparisons are meaningful—even more so than the information supplied by the manufacturers.



**M**ost high-performance engines can be pretty hard to start when they're new. The piston sleeve is tapered toward the top of the cylinder. As a result, the piston can get stuck at the top of the cylinder, especially when the engine is cold. It may seem odd, but it's quite normal for a piston in a newer engine to get stuck in the cylinder.

To some extent, this is true of all engines, but high-performance engines are more difficult to start because the piston/sleeve fit is slightly tighter than the average sport engine's. What can you do to prevent the piston from getting stuck? During the initial start-up, you can take a couple of steps, neither of which is difficult or costly.

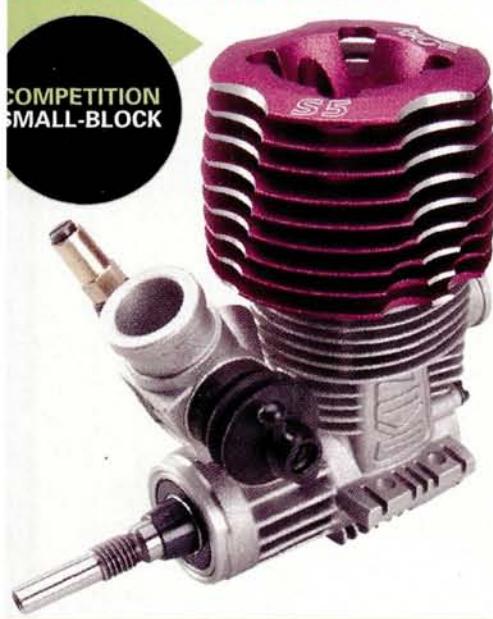
Remove the glow plug and put a couple of drops of Fantom After Burn oil or a similar high-

## ARE RACING ENGINES HARDER TO TUNE?

**A**re high-performance engines harder to tune? Yes and no.

Aggressive porting and high compression make tuning such engines a little more critical. The fuel mixture needle settings must be more precise because a bad setting has a greater impact on a high-performance engine's performance. In better engines, however, the carburetors also meter fuel more precisely, the components fit better, they wear less rapidly, etc. So, the net effect is that tuning a high-performance engine is often easier overall.

# NOVAROSSI RS12 T5



COMPETITION  
SMALL-BLOCK

## TEARDOWN

**Manufacturer:** Novarossi

**Price:** \$399

Varies with dealer

**Bore:** 13.8mm

**Stroke:** 14mm

**Carb:** all-aluminum 3-needle slide carb with 5.4mm bore

**Sleeve material:** brass/chrome

**Transfer ports:** 5

**Crank bearings (F/R):** 7x19/11x21mm

**Cylinder head:** 2-piece, 4-bolt head for turbo-type plugs

**Peak torque:** 60.1 oz.-in. @ 22,000rpm

**Practical rpm range:** 4,000 to 44,000

**Rpm @ peak hp:** 28,500

**Max. power output:** 1.54 bhp

**COMMENTS** It's hard to imagine that only three years ago, the hottest engine made about 0.52 bhp, and this monster roughly triples that at 1.54 bhp. The RS12 T5 is amazingly powerful; in fact, it's more powerful than every other small-block we've tested, and that includes .15 and .18 mills. Small-block technology is evolving rapidly, and better engines consistently raise the performance threshold. This engine, however, just blows away all expectations of small-block performance. Breaking the threshold of 60 oz.-in. of torque and with more than 1.5hp, it's solidly in big-block-performance country. It's more like a sport big-block than a competition engine, but getting this kind of power from a small-block of any size is nothing short of incredible—even more so knowing it's a .12 and not a larger-displacement small-block.

### CARBURETOR FEATURES

- Adjustable "seat" (third needle) for fine performance tuning.
- Double O-ring seals.
- Adjustable ball-type actuator to connect the linkage to the slide valve.
- Ball ends included with engine.

### ENGINE-BLOCK FEATURES

- Transfer passages are cast to ensure precise shape and volume.
- Excellent tolerances; engine components show a precision fit.
- Special passages allow additional oiling of the crank bearings.
- Standard, round, rear exhaust port.

### CRANKSHAFT FEATURES

- 4.3mm rod journal.
- 6.9mm induction port.
- "Turbo-style" cutaway at the center port's exit.
- Oil groove in the shaft near the front bearing and an oil hole near the rear bearing improve lubrication.

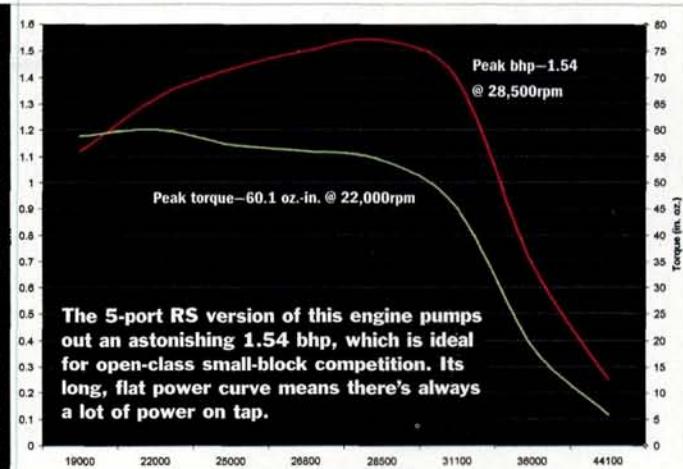
### PISTON-SLEEVE FEATURES

- ABC construction with premium materials and a precision-honed bore.
- 5-port design for maximum power.
- Indexed to engine block with a locating pin for perfect port alignment.
- Intake ports are angled toward the rear of the cylinder to prevent the loss of unburned fuel through the exhaust port.

### PISTON AND CONROD FEATURES

- Dual oil grooves in the piston retain lubricant.
- Piston is machined out of superior bar-stock aluminum.
- Knife-edged conrod.
- Hourglass cut

### DYNO-TEST RESULTS



The 5-port RS version of this engine pumps out an astonishing 1.54 bhp, which is ideal for open-class small-block competition. Its long, flat power curve means there's always a lot of power on tap.

on piston skirt reduces contact area and allows higher rpm.

### CYLINDER-HEAD FEATURES

- More versatile 2-piece head.
- Standard and turbo glow-plug inserts are available.
- Cooling fins have been milled to facilitate access to the engine-mounting screws.
- Thick, large-diameter heat-sink-head insert dissipates heat more efficiently.

### MODELS AVAILABLE

**RS12 S1**—3-port, slide carb, SG crank, standard plug

**RS12 S2**—3-port, slide carb, threaded crank, standard plug

**RS12 T5 S1**—5-port, slide carb, SG crank, turbo plug

**RS12 T5 S2**—5-port, slide carb, threaded crank, turbo plug

**NS12 S3**—3 port, turbo plug, EFRA-legal\* crank

**NS12 S5**—5-port, turbo plug, EFRA-legal crank

**NSR12 S3**—3-port, turbo plug, turbo crank

**NSR12 S5**—5-port, turbo plug, turbo crank

**RR12 L3**—3-port, long-stroke, turbo plug, EFRA-legal crank

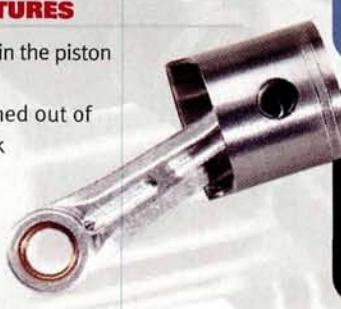
**RR12 L5**—5-port, long-stroke, turbo plug, turbo crank

"NS" engines are a generation newer than the "RS" versions.

\*Legal for EFRA-sanctioned racing and all other organizations.

### APPLICATION INFO

The wide variety of Novarossi engines means there's one for every application. There are subtle differences between them. Pull-start side-exhaust models (not listed) are also available. Consult your dealer for more information.



# O.S. ENGINES .21 VZ-B

COMPETITION  
BIG-BLOCK



## TEARDOWN

**Manufacturer:** O.S. Engines

**Distributor:** Great Planes Model Distributors

**Price:** \$280

Varies with dealer

**Bore:** 16.6mm

**Stroke:** 16mm

**Carb:** aluminum 3-needle slide type

**Sleeve material:** chrome-plated brass

**Transfer ports:** 3

**Crank bearings (F/R):** 7x19/14x25mm

**Cylinder head:** 1-piece, 4-bolt head for standard glow plugs

**Peak torque:** 96.8 oz.-in.

**Practical rpm range:** 3,000 to 43,000

**Rpm @ peak hp:** 25,400

**Max. power output:** 2.54 bhp

**COMMENTS** The .21 VZ-B is the most powerful O.S. off-road engine ever built, and it has everything we expect from O.S.—excellent workmanship, precise tolerances and premium-quality materials, and it's relatively easy to tune. A new 20L carb is the first 3-needle to find its way into an O.S. engine, and it proved to be as solid and as easy to adjust as the 20B and 21B carbs used on O.S.'s previous generation of engines.

The VZ-B clocks in at 2.54 bhp. Even with this high power output, the O.S. competition engines' trademark flat torque curve is still there. The "B" in "VZ-B" denotes that it's a buggy engine; it will easily move a big 1/8 off-road machine from corner to corner. Our results also show that it's plenty capable of pulling for the entire length of a long straightaway and that it tops out at nearly 43,000 rpm.

### CARBURETOR FEATURES

- Insulating sleeve insulates the carb from engine heat.
- Third needle makes it possible to adjust midrange response.
- Smooth venturi maximizes airflow.
- All-metal main needle assembly ensures precise mixture settings and a consistent fuel flow.

### ENGINE-BLOCK FEATURES

- Standard rear-exhaust flange fits most popular headers.
- Indexing pin ensures proper sleeve alignment.
- Cast transfer ports smooth airflow.
- Oil passages enhance bearing lubrication.

### CYLINDER-HEAD FEATURES

- One-piece head enhances thermal efficiency.
- Uses standard O.S. glow plugs.
- 10 cooling fins ensure maximum cooling even in high temps.

### CRANKSHAFT FEATURES

- Induction port matches the engine block well.
- Pilot crankshaft means reduced vibration.
- Optimized for smooth, high-volume air/fuel mixture delivery.
- Lubrication hole feeds the rod journal.

### PISTON-SLEEVE FEATURES

- Precision-honed, hard-chrome-plated bore.
- Simple but effective 3-port configuration.
- Contoured boost and transfer ports improve air/fuel flow.
- Exhaust port has elliptical upper edge.



### PISTON AND CONROD FEATURES

- Cutaway in piston skirt allows better air/fuel flow through the boost port.
- Oil grooves near the dome retain oil for better lubrication.
  - The oil hole is in the crankshaft instead of the conrod, so the rod is stronger.
- Conrod is made of 7075 T-6 aluminum.

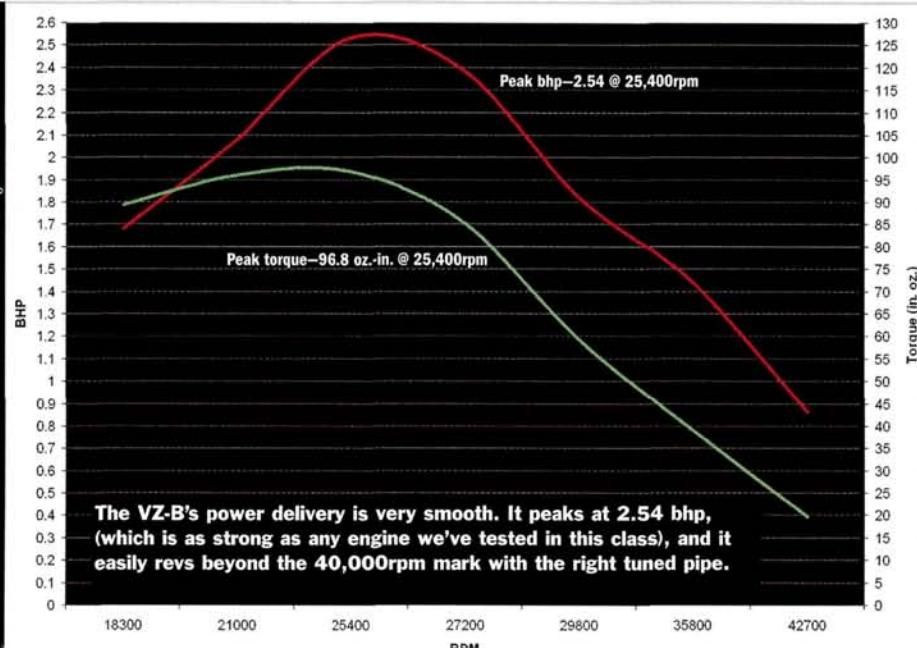
### MODELS AVAILABLE

**RVZ-B (P)**—3-port, slide-carb, SG shaft, standard plug

### APPLICATION INFO

The "B" in "VZ-B" means this engine is ideal for buggies; it's obviously best suited to 1/8 off-road buggies. It will also power truggy-style monster trucks, rally cars and other big-block applications in which an SG crank and bump-start are required and for which good punch and lots of horsepower are preferred.

### DYNO-TEST RESULTS



# SIRIO S27XL RACER

## MONSTER-BLOCK



### CARBURETOR FEATURES

- Machined-aluminum 8mm venturi insert (7, 7.5, 8.5 and 9mm inserts optional).
- Durable all-metal main mixture-needle assembly.
- The slide valve has an aluminum bore for precise fit and long wear.
- Durable steel sleeve around lower venturi section.



### ENGINE-BLOCK FEATURES

- The block has cast mounts for use with a 2-piece header spring.
- Double O-ring seals are installed.
- Standard rear-exhaust port accepts most standard exhaust manifolds.
- Interior millwork promotes smoother air/fuel flow.

### CRANKSHAFT FEATURES

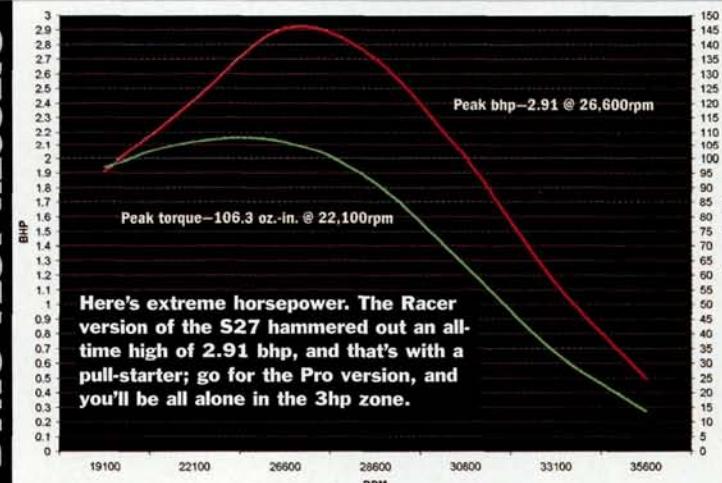
- Pilot (SG) crankshaft design minimizes vibration.
- Strong, 5mm rod journal still allows a thick lower conrod end for durability.
- Front bearing is rubber-sealed to prevent it from being ruined by dirt.
- Racer and Pro versions have turbo porting.



### CYLINDER-HEAD FEATURES

- 2-piece head is less expensive to replace if the glow-plug threads wear.
- Includes inserts for standard and turbo glow plugs.
- Large-diameter head button ensures better heat transfer.

### DYNO-TEST RESULTS



Here's extreme horsepower. The Racer version of the S27 hammered out an all-time high of 2.91 bhp, and that's with a pull-starter; go for the Pro version, and you'll be all alone in the 3hp zone.

### PISTON-SLEEVE FEATURES

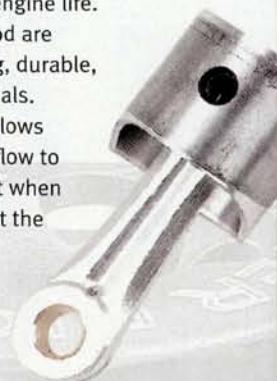
- True ABC construction means durability and performance.
- Competition-bred port configuration ensures more horsepower.
- Sleeve has a beveled lower edge that improves air/fuel flow.



- 7 transfer ports ensure more precise fuel delivery.

### PISTON AND CONROD FEATURES

- Bypass ports in piston improve air/fuel flow.
- Taper in piston crown eases break-in and creates a wider pinch zone on the piston that prolongs engine life.
- Piston and conrod are machined of strong, durable, high-quality materials.
- Skirted piston allows better air/fuel flow to the boost port when the piston is at the bottom of the cylinder.



### MODELS AVAILABLE

**S27S**—Standard: 3-port, slide carb, SG shaft, pull-starter, standard or turbo plug  
**S27R**—Racer: 7-port, slide carb, turbo crank, SG shaft, pull-starter, standard or turbo plug  
**S27Pro**—7-port, slide carb, turbo crank, SG shaft, pull-starter, standard or turbo plug

## TEARDOWN

**Manufacturer:** Sirio

**Distributor:** Trinity Products Inc.

**Price:** \$400

**Bore:** 17.9mm

**Stroke:** 17.6mm

**Carb:** 2-needle composite/aluminum slide-type with 8mm insert

**Sleeve material:** chrome-plated brass

**Transfer ports:** 7

**Exhaust ports:** 3

**Crank bearings (F/R):** 7x19/14.2x25mm

**Cylinder head:** 2-piece, 4-bolt head for standard or turbo glow plug

**Peak torque:** 106.3 oz-in. @ 22,100rpm

**Practical rpm range:** 3,000 to 36,000

**Rpm @ peak hp:** 26,600

**Max. power output:** 2.91bhp

**COMMENTS** This S27XL Racer generates 2.91 bhp, which is huge. Its peak torque of 106.3 oz-in. is also tops in its category. Its large displacement can be credited for some of this mill's numbers, but it takes a lot more than displacement to produce these results. It takes a combination of high-quality materials, precision machining and the right specifications to get near the 3hp mark, and the S27 delivers on all three counts.

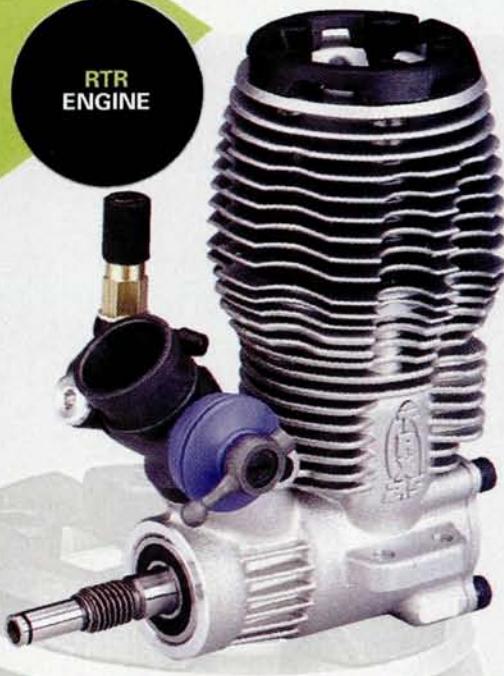
The S27 Racer and Pro engines are the horsepower kings at present, so they warrant their premium prices (twice as much as the next most powerful engine, but they're the ultimate engines for the well-funded and power hungry).

### APPLICATION INFO

The S27 fits any application in which a rear-exhaust big-block engine can be installed because the block size is identical to that of a standard big-block. The standard version is available only with a pull-starter. The Racer and Pro versions are almost the same; the Pro just has a pull-starter. These engines are very well suited to big-block buggies and monster trucks that need tons of Outlaw power.

# TRAXXAS TRX 2.5

RTR ENGINE



## TEARDOWN

**Manufacturer:** Traxxas

**Price:** \$145 w/recoil starter & IPS crank

Varies with dealer

**Bore:** 14.7mm

**Stroke:** 14.7mm

**Carb:** 2-needle, composite slide w/6mm bore

**Sleeve material:** chrome-plated brass

**Transfer ports:** 3

**Crank bearings (F/R):** 12x21/7x17mm

**Cylinder head:** 1-piece, 5-bolt head designed for standard plugs

**Peak torque:** 44.1 oz.-in. @ 28,800rpm

**Practical rpm range:** 4,000 to 41,000

**Rpm @ peak hp:** 30,200

**Max. power output:** 1.33 bhp

**COMMENTS** RTR engines aren't usually mentioned in the same breath as the distinguished company shown here, but the TRX 2.5 isn't an average RTR engine. We don't distinguish between big-blocks and small-blocks in the most powerful RTR category. This is a pound-for-pound, most-power-per-cubic-centimeter-takes-all category, and the TRX 2.5 is the hands-down winner.

Designed as the standard engine for the 2.5 T-Maxx, it's intended to produce maximum power from a small-block platform and for a reasonable price. Starting with a clean slate allowed Traxxas to incorporate numerous performance-enhancing features to ratchet power output up beyond most other small blocks'. It's simply a superior all-around engine that will be tough to beat, even with certain big-blocks.

## CARBURETOR FEATURES

- Very fine-pitch threads on the mixture needles allow finer adjustments.
- The smooth venturi mates perfectly with the air filter for a smoother airflow.
- A metal sleeve around the bottom of the carb prevents it from being damaged when the carb clamp is tightened.

## ENGINE-BLOCK FEATURES

- A ported backplate enhances the flow of the air/fuel mixture to the transfer ports.
- A precision-cast and -machined intake passage closely matches the carburetor for more efficient air/fuel flow.
- Cast transfer and boost passages allow more effective port matching and improved air/fuel flow.
- Has a large bronze bushing in the backplate for the starter shaft (auto-start versions).

## CRANKSHAFT FEATURES

- Full disc counterweight for less vibration and turbulence.
- High-quality crank bearings reduce friction and can run at very high rpm.
- The integrated pilot shaft (IPS) design reduces vibration and eliminates the loss of performance associated with bolt-on pilot shafts.

## PISTON-SLEEVE FEATURES

- 3-port configuration.
- Radiused outer edge at the bottom of the sleeve promotes flow to the transfer ports.
- Chamfered inner edge at the bottom of the sleeve eases assembly.

## PISTON AND CONROD FEATURES

- The knife-edged connecting rod cuts through the air/fuel mixture in the crankcase and produces less turbulence and drag; this

equals more power at high rpm.

- No bushing in the upper end of the rod. The engineers felt it wasn't necessary; doing without it reduces cost, maintenance and reciprocating weight (and that means more power).
- An offset wristpin connects the piston and connecting rod; this minimizes side loads on the piston, reduces wear and friction and increases power.

- "Square" geometry: the stroke and bore dimensions are the same. This, according to Traxxas, is a key feature in developing a broader powerband.

## CYLINDER-HEAD FEATURES

- Molded-plastic trim ring snaps into the top of the engine to protect the head during rollovers.
- Designed for use with standard glow plugs.
- Cutouts in the head allow easy, straight-in access to the engine-mounting screws.

## MODELS AVAILABLE

**5209**—3-port, slide carb, IPS crank, pull-starter, standard plug

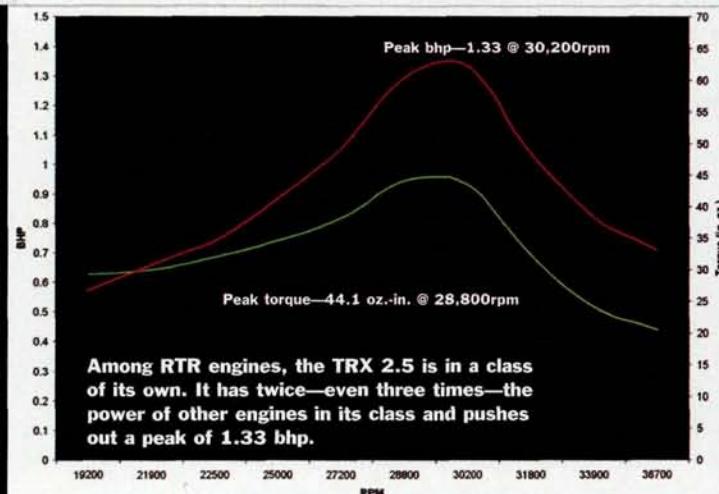
**5207**—3-port, slide carb, multi-shaft, pull-starter, standard plug

## APPLICATION INFO

The TRX 2.5 engine was developed for the Traxxas T-Maxx and the later Nitro 4-TEC. It has a unique exhaust flange, so it requires a specific header. There's a special header for installing it in the T-Maxx, and there's a 90-degree header for installing it in the 4-TEC or any other touring car or stadium truck in which the engine must be mounted transversely.

Traxxas is currently working on exhaust headers that will allow this engine to fit more vehicles.

## DYNO-TEST RESULTS



Among RTR engines, the TRX 2.5 is in a class of its own. It has twice—even three times—the power of other engines in its class and pushes out a peak of 1.33 bhp.

# SIRIO S15 P-PORT TURBO

OUTLAW  
SMALL-BLOCK



## TEARDOWN

**Manufacturer:** Sirio

**Distributor:** Trinity Products Inc.

**Price:** \$269.99

Varies with dealer

**Bore:** 14.8mm

Stroke 14.4mm

**Carb:** composite 2-needle rotary carb w/6mm bore

**Sleeve material:** chrome-plated brass

**Transfer ports:** 5

**Crank bearings:** 11.2x21mm

**Cylinder head:** 2-piece, 4-bolt head for turbo-type plugs

**Peak torque:** 70.1 oz.-in.

**Practical rpm range:** 4,000 to 41,000

**Rpm @ peak hp:** 26,700

**Max. power output:** 1.57 bhp

**COMMENTS** This Sirio .15 is unique in that it's the only competition-bred .15 rear-exhaust with 5 ports and a turbo head and crank; basically, it's a larger version of Sirio's open-class .12 turbo engine. It takes "Outlaw" to an entirely new level with best-in-class power and a peak torque of more than 70 oz.-in. (this literally matches sport big-block torque). It doesn't run "like" a big-block; it IS a big-block in a small-block crankcase.

This engine is currently available only with a rotary carb and a threaded crankshaft. This makes it well suited to 2WD and 4WD stadium trucks. We would like to see a slide-carb version for trucks and touring cars. Like its race-legal cousins, the Sirio .15 rear-exhaust comes without a starter, but if you have a starter box, it's tough to beat.

### CARBURETOR FEATURES

- Two mixture needles.
- All-metal main needle housing.
- Large, 6mm, venturi.
- Composite body construction.

### ENGINE-BLOCK FEATURES

- Transfer passages are cast to ensure more precise shape.
- Indexing pin for sleeve.
- Cast header-spring mounts.
- Standard rear-exhaust flange.

### CRANKSHAFT FEATURES

- Oil groove near front bearing siphons away excess oil.
- Large induction port for maximum fuel intake.
- 4.5mm rod journal.

### CYLINDER-HEAD FEATURES

- Insert for 2-piece head designed for turbo plug.
- Large, blue-anodized heat sink.
- Machined where the head contacts insert; this maximizes cooling.

### PISTON-SLEEVE FEATURES

- Extra-wide 3-port exhaust.
- Indexed to engine block for perfect port alignment.



- 5 transfer/boost ports.

- Precision-honed, hard-chromed bore for performance and durability.

### PISTON AND CONROD FEATURES

- Knife-edged conrod with double bushings.
- High-silicon-aluminum piston for performance and durability
- Relieved piston skirt promotes "breathing."
  - Tapered piston for easier break-in, better performance and longer life.

### MODELS AVAILABLE

**S15TUPAF**—5-port, ABC, rotary carb, threaded crank, standard plug.

### APPLICATION INFO

This engine will fit most 1/10 2WD and 4WD stadium trucks and other applications in which a rear exhaust, a threaded crank and a rotary carb are preferred. Not legal for sanctioned racing. Only for vehicles in which the flywheel is accessible for starting by means of a starter box.

### SOURCES

**FANTOM RACING** (269) 649-9583; [fantom-motors.com](http://fantom-motors.com).

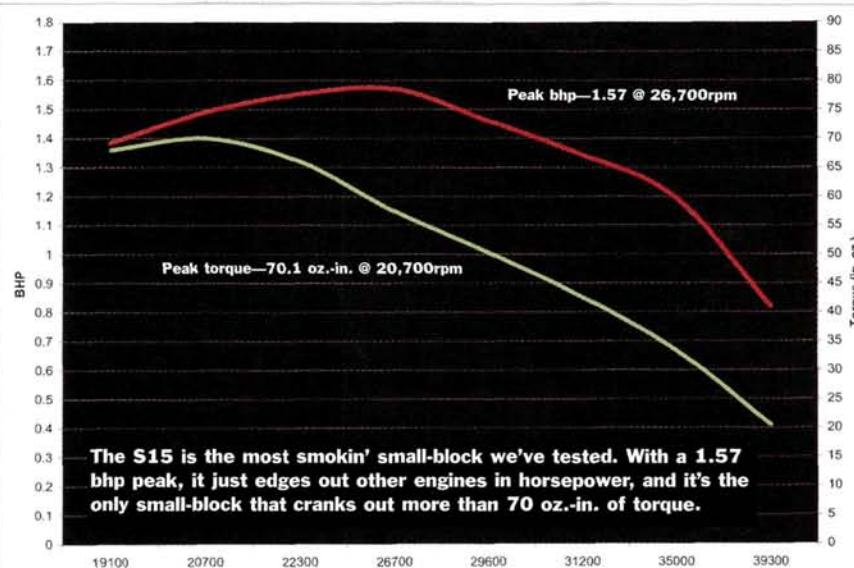
**NOVAROSSI** [novarossi.it](http://novarossi.it).

**O.S. ENGINES** distributed by Great Planes Model Distributors (217) 398-6300; (800) 682-8948; [osengines.com](http://osengines.com).

**SIRIO** distributed exclusively by Trinity Products Inc. (732) 635-1600; [teamtrinity.com](http://teamtrinity.com).

**TRAXXAS CORP.** (972) 265-8000; [traxxas.com](http://traxxas.com).

### DYNO-TEST RESULTS



by Matt Higgins

# RC RACING



As long as there have been full-size cars, there have been people racing them, and the same is true of RC cars. As soon as we got our hands on even the earliest RC rigs, we raced them to see which was the fastest. Racing quickly became—and still is—an integral part of the hobby. Heck; just ask anyone who has been in this hobby for a while why they're so hooked, and they'll tell you that it's the racing. In addition to being fast, exciting and, of course, fun, racing has kept people involved because it adds a dimension to RC that is simply unmatched. If you think you might want to try racing, check out this guide to learn about all the classes that tear up tracks every weekend.

Although we couldn't include every form of RC racing, we tried to cover all the basics. Read on, and get ready to get racing!

## OFF-ROAD

Off-road racing is a long-standing favorite among hobbyists, and for good reason. Between the trucks and buggies getting airborne off the jumps and the dirt flying, the action is just sick. This racing style takes place on purpose-built dirt tracks, and the tracks do vary from location to location. Most are outdoors, but not all. The biggest difference in off-road tracks is the surface. But dirt is dirt, right? Wrong. Some tracks have loose, loamy dirt and others are made of hard-packed clay. Off-road tracks also vary quite a bit in size. Whether the track is big or small, hard clay or soft dirt, these are the most popular classes:

### ELECTRIC STADIUM TRUCK

Electric-powered stadium trucks have the same basic platform as 2WD buggies, but compared with buggies, trucks usually have a longer chassis (for an increased wheelbase), longer suspension arms (for a wider stance) and larger tires. Because of those features, most racers find stadium trucks easier to drive. They corner well, jump with ease and are less sensitive to suspension tweaks than their buggy counterparts. All of this makes them the most popular off-road racing class each weekend. The races are usually 5 minutes long, with classes for stock and modified trucks. By far, the stock class is the most popular and the most beginner-friendly.

#### RATINGS

AFFORDABILITY	4
SPEED	3
SKILL BUILDING	3
POPULARITY	5
BEGINNER-FRIENDLY	4

#### SOLID PICKS

- > DURATRAX EVADER ST
- > TEAM ASSOCIATED T4
- > TEAM LOSI TRIPLE-X SERIES

## WANNA



### NITRO STADIUM TRUCK

Many people are simply attracted to the awesome sound and smell of these nitro-burning trucks, and now that engines are becoming easier to tune and keep running, more racers are moving over to join the ranks in this class. Nitro stadium trucks are very similar to the electric versions, but they boast an insane power-to-weight ratio. These trucks, even with just the small-blocks, have much more power than they need. Although the qualifying races for nitro stadium trucks are usually fairly short—about 5 or 7 minutes, the Mains are often an hour long with frequent pit stops for refueling.

#### RATINGS

AFFORDABILITY	3
SPEED	4
SKILL BUILDING	3
POPULARITY	3
BEGINNER-FRIENDLY	3

#### SOLID PICKS

- > MUGEN MST-1
- > TEAM ASSOCIATED GT
- > TEAM LOSI TRIPLE-XNT
- ADAM DRAKE EDITION

# CLASS GUIDE

## ABOUT THE RATINGS

We've rated each class for affordability, speed, skill building, popularity and beginner-friendliness. Scores vary from 1 to 5; 5 is best.

**AFFORDABILITY** If you're on a tight budget, look for a class that scores high in "Affordability"; we factored in not only the startup cost of the car

or truck, but also considered the prices of necessary equipment such as fuel, tires, batteries and other supplies.

**SPEED** Those who have the need for speed, should look for a rating of 4 or 5. None of these racing classes are slow, but some of them (1/8-scale on-road, for example) reach insane speeds of close to 80mph!

# RACE?

**ELECTRIC 2WD BUGGY** This is one of the oldest racing classes in RC and is still the most coveted class in IFMAR Off-Road World Championship racing. Although not exceedingly difficult to drive, 2WD buggies do require more skill—or at least finesse—than their stadium-truck counterparts. This class is the favorite of many pro drivers and is one of the most competitive classes at national and world events. Just like the electric stadium truck class, the race length for 2WD buggies is usually 5 minutes. In the past, races were only four minutes, but Stock switched to 5-minute races when better batteries were developed. Now, both the modified and stock buggy classes usually run 5 minutes.

### RATINGS

AFFORDABILITY	4
SPEED	3
SKILL BUILDING	4
POPULARITY	2
BEGINNER-FRIENDLY	3

### SOLID PICKS

- > TEAM ASSOCIATED B4
- > TEAM LOSI TRIPLE-X SERIES

## ELECTRIC 4WD BUGGY

These buggies are probably among the easiest RC cars to drive. Many racers comment that after driving a 2WD buggy, these 4-wheel-powered racers seem to run as if they're on autopilot. These dirt rockets tend to be more expensive than 2WD buggies and are slightly more complicated because of their 4WD drive trains, but they're no more complex than electric touring cars. Those who race in this class often favor modified power, and that also makes 4WD buggy racing more suitable for experienced racers.

### RATINGS

AFFORDABILITY	2
SPEED	4
SKILL BUILDING	3
POPULARITY	1
BEGINNER-FRIENDLY	3



### SOLID PICKS

- > TEAM LOSI TRIPLE-X4 GRAPHITE PLUS
- > YOKOMO MR4BC SE

**SKILL BUILDING** Classes with a high "Skill Building" score (1/12-scale electric on-road, for example), help you build driving and racing abilities that help you become a better overall racer and will carry over to other classes.

**POPULARITY** This is a tough item to rate, since a class that might have high national popularity (for example, electric stadium trucks) might actually be an unpopular class in your particular area. If we've given a low "Popularity" score to a class you're interested in, don't be discouraged (or offended!); it just means you may have fewer guys to race in that class.

**BEGINNER-FRIENDLY** If you're new to RC, stick to classes with a high "Beginner-Friendly" rating and stay away from classes with a very high "Speed" rating. Novice racers and RC cars that go over 70mph just don't mix.

**SOLID PICKS** Still shopping for a car? We've identified competitive cars for each class. Some classes are dominated by only two or three brands, while others may have dozens of competitive choices (we don't have room to list them all). Vehicles are listed alphabetically by brand. Best buying advice: go with a car that's been proven fast at your track and is well supported by the local shop.



# RC RACING CLASS GUIDE

## 1/8-SCALE NITRO BUGGY

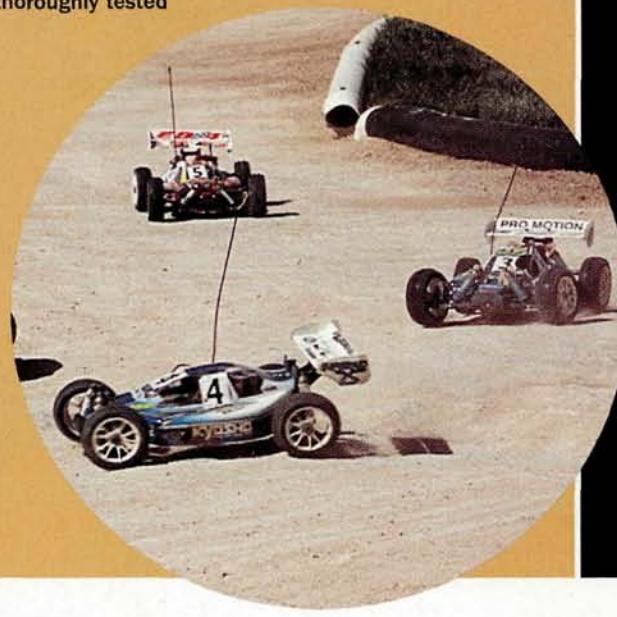
These huge 4WD buggies are propelled down the track with some serious big-block power. Although the AWD system makes them somewhat easier to pilot than some of the other vehicles, these do require a driving method unlike most other vehicles found on the dirt track because 1/8-scale nitro buggies like to be muscled pretty hard around the track. Like nitro stadium trucks, 1/8-scale buggies often run short qualifying races and up to hour-long Mains. Both the machines and drivers are thoroughly tested before the race is over.

### RATINGS

AFFORDABILITY	2
SPEED	4
SKILL BUILDING	3
POPULARITY	3
BEGINNER-FRIENDLY	2

### SOLID PICKS

- > GS RACING STORM PRO
- > KYOSHO INFERNO MP-7.5 SERIES
- > OFNA HYPER 7 SERIES
- > XTM X-TERMINATOR



## NITRO MONSTER TRUCK

As more and more monster trucks fly off the hobby store shelves, this racing class can't help but grow in leaps and bounds. Judging by the sales of trucks like the T-Maxx, it's safe to say that monster trucks are by far the most popular segment of the hobby, and each year, their racing presence increases. Because most monster trucks come as ready-to-run packages, they are also an easy gateway into RC racing. The nitro monster truck class tends to have the loosest set of rules, and the laid-back attitude appeals to many racers.

### RATINGS

AFFORDABILITY	4
SPEED	3
SKILL BUILDING	2
POPULARITY	3
BEGINNER-FRIENDLY	5

### SOLID PICKS

- > GS RACING SUT
- > HPI SAVAGE 25
- > TEAM ASSOCIATED MONSTER GT
- > TEAM LOSI LST
- > TRAXXAS T-MAXX



## ON-ROAD

On-road racing takes place on a variety of surfaces from carpet to purpose-built paved tracks to empty parking lots. Regardless of the racing surface, the tracks—with the obvious exception of oval racing—consist of a series of turns in all sorts of shapes. Some turns are tight hairpins; others are high-speed sweepers. On-road racing draws large numbers because people like speed and can relate to the cars on the track. This type of racing is very accessible to many enthusiasts because all you need—at the bare minimum—is an empty parking lot. Here are some of the on-road classes to check out:

## ELECTRIC TOURING CAR

The touring car class has almost single-handedly propelled on-road racing past off-road in popularity. These cars can be extremely fast, especially with modified power, but because of the stable handling characteristics of 4WD, many new racers find them easy enough to pilot around the track. As with all the other electric classes, if you're a beginner, stick with stock power until you get better behind the wheel.

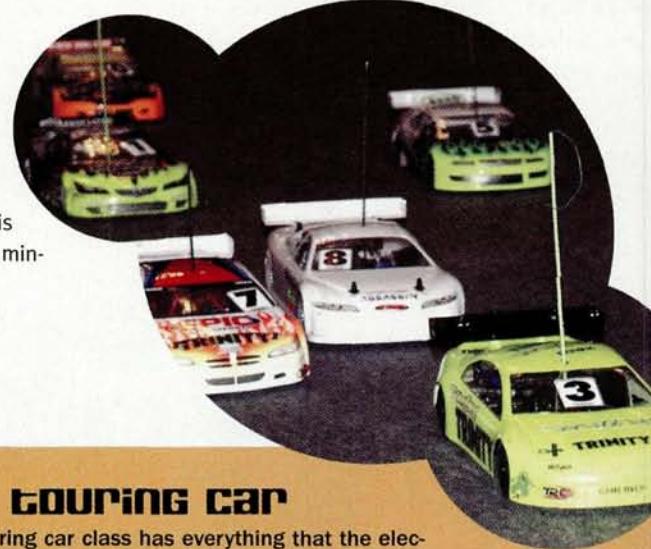
Since this class is so popular with racers, it has also become very popular with manufacturers. You'll find a huge variety of cars to choose from. There are 3-belt, 2-belt, single-belt and shaft-drive cars out winning races. With so many good choices, we can't possibly list them all here.

### RATINGS

AFFORDABILITY	4
SPEED	4
SKILL BUILDING	3
POPULARITY	4
BEGINNER-FRIENDLY	4

### SOLID PICKS

- > MRC STR-4 PRO
- > TAMIYA TB-02
- > TEAM ASSOCIATED TC3
- > TEAM LOSI TRIPLE-XS
- > XRAY T1 SERIES



## NITRO TOURING CAR

The nitro touring car class has everything that the electric touring car class does, but it adds even more speed and, of course, the beloved noise of a nitro engine. Like the nitro off-road classes, nitro touring car races often have extended Mains and pit stops. Because these cars are extremely fast and require engine-tuning skills, this class is best for those who already have nitro experience. Reflecting its wide-scale appeal, there are far too many manufacturers represented in this category for us to be able to cover them all.

### RATINGS

AFFORDABILITY	3
SPEED	4
SKILL BUILDING	3
POPULARITY	4
BEGINNER-FRIENDLY	3

### SOLID PICKS

- > GS RACING VISION PRO
- > KYOSHO FW-5R
- > MUGEN MTX-3
- > OFNA LD4 PRO
- > SCHUMACHER FUSION R12
- > SERPENT 705
- > TEAM ASSOCIATED NITRO TC3
- > TEAM MAGIC G4

## 1/12-SCALE ELECTRIC

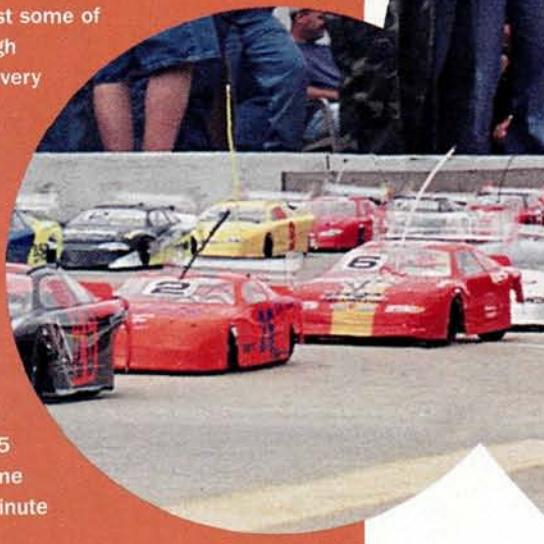
In the early days of RC racing, everyone raced 1/12-scale electric, but when dirt racing took off, this class lost some of its popularity. Although these vehicles aren't very complex, 1/12-scale electric cars absolutely rip up a roadcourse. You'll build up impressive driving skills as you become proficient driving one of these small racing machines. Race lengths in this class vary; most are 5 or 7 minutes, but some events run up to 9-minute races.

### RATINGS

AFFORDABILITY	4
SPEED	4
SKILL BUILDING	5
POPULARITY	1
BEGINNER-FRIENDLY	3

### SOLID PICKS

- > CALANDRA RACING CONCEPTS (CRC) CARPET KNIFE
- > CORALLY SP12M
- > SPEEDMERCHANT REV-3
- > TEAM ASSOCIATED RC12L3
- > TRINITY REFLEX 12



## ELECTRIC DUAL

You can find oval races on carpet, pavement, concrete and even dirt (hey, does that make it off-road?). These days, most electric oval racing mimics the highly popular full-size NASCAR stock cars, so if you're a big Dale Earnhardt Jr. or Jeff Gordon fan, this might be the type of racing for you. In design, these cars are similar to 1/12-scale electric on-road cars. There are 1/12-scale oval cars, but most are 1/10-scale. Oval racing is very fast and exciting, but it is another one of those classes that requires quite a bit of tuning to stay out front, so if you're a beginner and want to run oval, hook up with one of the fast guys.

### RATINGS

AFFORDABILITY	3
SPEED	4
SKILL BUILDING	3
POPULARITY	1
BEGINNER-FRIENDLY	2

### SOLID PICKS

- > HYPERDRIVE 0700 E.A.S.E.
- > SPEEDMERCHANT WF010
- > TEAM ASSOCIATED RC10L40
- > TRINITY REFLEX 10SS

## 1/8-SCALE NITRO

Often called the F1 of RC, these cars are simply ballistic! As in the other nitro classes, the 1/8-scale nitro beasts can have hour-long Mains with pit stops, but they take it a step further and often add a tire change to the pit crew's refueling duties. These cars are serious racing machines and aren't for the faint of heart, but if you have racing experience and are ready to get serious, then the 1/8-scale nitro on-road class might be right for you.

### RATINGS

AFFORDABILITY	1
SPEED	5
SKILL BUILDING	4
POPULARITY	1
BEGINNER-FRIENDLY	1

### SOLID PICKS

- > KYOSHO F2004
- > MUGEN MRX-3
- > SERPENT 950R



# RC RACING CLASS GUIDE

## RACE DAY DO'S AND DON'TS

### DO'S

- Do show up early.
- Do use your frequency clip.
- Do drive from the drivers' stand.
- Do grant the right of way to faster cars.
- Do treat the other racers with respect.
- Do be ready to race on time.
- Do return the transponder after your race.

### DON'TS

- Don't go to the races unprepared.
- Don't turn on your radio unless you have the frequency clip.
- Don't drive from trackside or from the center of the track.
- Don't block faster cars unless you're racing for position.
- Don't yell at the corner marshals.
- Don't skip out on corner marshalling.
- Don't hog the frequency clip.



## A day at the races

Going to your first race should be fun—and it will be. Here's a rundown of a typical race day.

**9 a.m.** Racers arrive at the track and start setting up their pits. Some racers arrive even earlier so they'll have as much time to practice as possible.

**9:30 a.m.** Everyone is practicing on the track or working on their setups in the pits.

**10 a.m.** The race director calls for people to begin signing up. This lets him or her know who will be in which classes.

**12 p.m.** The race director announces that sign-up is closing.

**12:15 p.m.** The heats are posted. This print-out shows which races you'll be in. Double check that your frequency is listed correctly and that you've been placed in the right class.

**12:30 p.m.** The first round of qualifying starts. Depending on the track, there will be two or three rounds of qualifying. There's usually a short break between each qualifier and a longer break before the start of the Mains.

**3 p.m.** The Mains start.

**4:30 p.m.** The Mains conclude, and the race day is over.

**5 p.m.** "Yo quiero Taco Bell."

## RACING LINGO

### Blue groove

The hard-packed racing lane that turns blue because of the rubber deposits left by the tires.

### Bump-up system

When the winner (or even the top two finishers) are "bumped up" to the next higher Main.

### Coil

The wire loop that senses the transponders for the lap-counting computer.

### Corner marshal

People who are positioned around the track to place crashed cars back on the track. After each of your races, you are required to serve as corner marshal.

### DNF

Abbreviation for "Did not finish."

### DNS

Abbreviation for "Did not start."

### Hack

Anyone who crashes a lot could be called a hack, but true hacks are known for taking out other drivers—accidentally or intentionally. Don't be a hack.

### Heat

Another word for qualifier.

### Main

The actual race or main event. The A-main will be the fastest group.

### Pro

Short for professional; someone who gets support from a factory or is even paid to race.

### Qualifier

A race that's used to determine the starting order in the Mains.

### Race director

The person who runs the races.

### TQ

Abbreviation for top qualifier.

### Transponder

An electronic device placed in the car. Each time the transponder goes across the coil, a signal is sent to the lap-counting computer.

### Trophy girl

You'll know one when you see one.

Cut out these pics, stack them up, staple the left side and flip away. Even if you finish dead last, she'll wave that checkered flag for you.



## SOURCES

**CALANDRA RACING CONCEPTS (CRC)** (315) 338-0867; [teamcrc.com](http://teamcrc.com).

**CORALLY USA** distributed by Specialized RC Intl. (407) 681-5905; [corallyusa.com](http://corallyusa.com).

**DURATRAX** distributed by Great Planes Model Distributors; [duratrax.com](http://duratrax.com).

**GREAT PLANES MODEL DISTRIBUTORS** (217) 398-6300; (800) 682-8948; [greatplanes.com](http://greatplanes.com).

**GS RACING** distributed exclusively by General Silicones Group Inc. (626) 338-3815; [gsracing.com](http://gsracing.com).

**HPI RACING** (949) 753-1099; [hpiracing.com](http://hpiracing.com).

**HYPERDRIVE** (931) 364-7673; [hyperdriveracing.com](http://hyperdriveracing.com).

**KYOSHO** distributed by Great Planes Model Distributors; [kyosho.com](http://kyosho.com).

**MODEL RECTIFIER CORP. (MRC)** (732) 225-2100; [modelrectifier.com](http://modelrectifier.com).

**MUGEN USA** (949) 707-5607; [mugenracing.com](http://mugenracing.com).

**OFNA RACING** (949) 586-2910; [ofna.com](http://ofna.com).

**SCHUMACHER USA** (813) 889-9691; [racing-cars.com](http://racing-cars.com).

**SERPENT INC. USA** (305) 639-9665; [serpent.com](http://serpent.com).

**SPEEDMERCHANT** (978) 597-3344; [teamspeedmerchant.com](http://teamspeedmerchant.com).

**TAMIYA AMERICA INC.** (800) 826-4922; [tamiyausa.com](http://tamiyausa.com).

**TEAM ASSOCIATED** (714) 850-9342; [teamassociated.com](http://teamassociated.com); [rc10.com](http://rc10.com).

**TEAM LOSI** distributed by Horizon Hobby Inc. (800) 338-4639; [teamlosi.com](http://teamlosi.com); [horizonhobby.com](http://horizonhobby.com).

**TEAM MAGIC** distributed by Trinity Products Inc.

**TRAXXAS CORP.** (972) 265-8000; [traxxas.com](http://traxxas.com).

**TRINITY PRODUCTS INC.** (732) 635-1600; [teamtrinity.com](http://teamtrinity.com).

**XRAY** distributed by Serpent USA; [teamxray.com](http://teamxray.com).

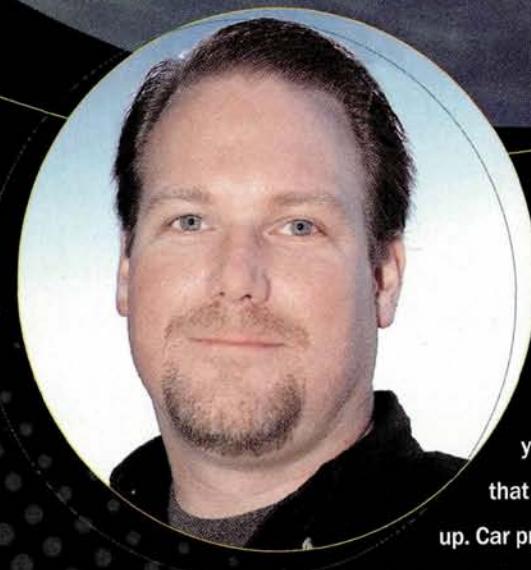
**XTM RACING** distributed by Global Hobby Distributors (714) 964-0827; [xtm.globalhobby.com](http://xtm.globalhobby.com).

**YOKOMO USA** (949) 252-8663; [yokomousa.com](http://yokomousa.com).





# how to race prep your nitro tourer with Joel Johnson



by Joel Johnson

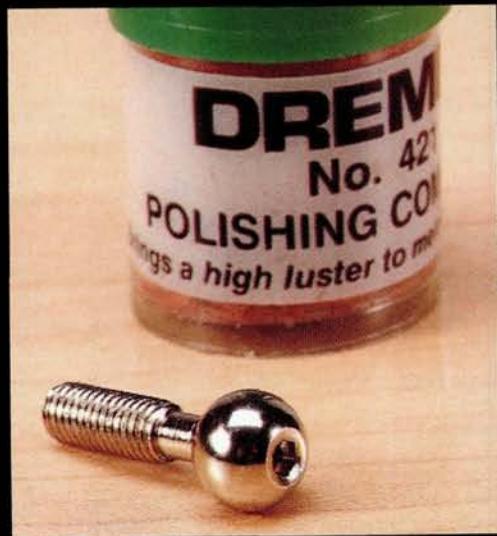
**N**itro season is upon us once again, and it's time to prep last year's ride or to start building that nice new kit you've just picked up. Car preparation and proper assembly are the keys to having fun at the track; they can make the difference between winning and losing. The following tips helped me win a few races in my time, and they'll help you get your ride race-ready for the coming season. Do the work up front to get the most out of your time at the track.

## 1 POLISH THE HINGE PINS AND PIVOT BALLS.

The first trick is to polish the hinge pins and pivot balls so the suspension arms don't bind. Anything metal that slides on plastic or other metal should be polished. A Dremel tool works great for this and is an essential part of any racer's toolbox. Chuck the hinge pin or pivot ball in the Dremel and put some polish on a rag. Mother's aluminum polish and Simichrome polish work great on most metals. They can be found at any auto-supply store.

### PRO TIP

Adjust your car's pivot balls so they will operate without slop and let them break in. It's OK if they're a little tight, the stress of gas racing loosens things up quickly.

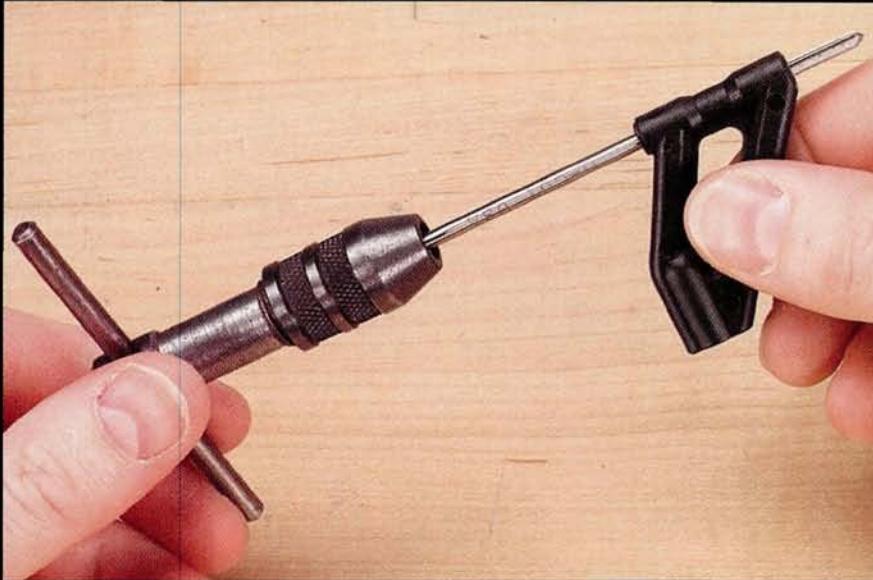


## 2 SUSPENSION ARM BIND BUSTERS.

Another trick that goes with polishing the hinge pins is to heat the plastic arms a little when the pins don't slide through freely. Sometimes, a part will warp slightly when it cools after being removed from the mold. The hinge-pin holes can then be mildly distorted and don't align properly with the pins, which then bind. To remedy this, place the hinge pin in the arm and carefully heat the arm with a heat gun. The heated plastic will return to its intended shape. This works best with softer plastics; don't try it on the fiber-filled or graphite arms.

### PRO TIP

To test your assembly for binding, remove the shocks and see if the suspension arms fall under their own weight. If they don't, you've got some freeing up to do.



## 3 SMOOTHER BELTS.

This is a trick I've used on my Trinity Reflex NT and G4 nitro cars. Soak the black rubber drive-train belts in WD-40 to soften them. The WD-40 makes the belts more flexible, and therefore, the drive train operates more freely. Soaking the belts for 24 to 48 hours usually does the trick. A free-spinning drive train is the key to speed in any scale.



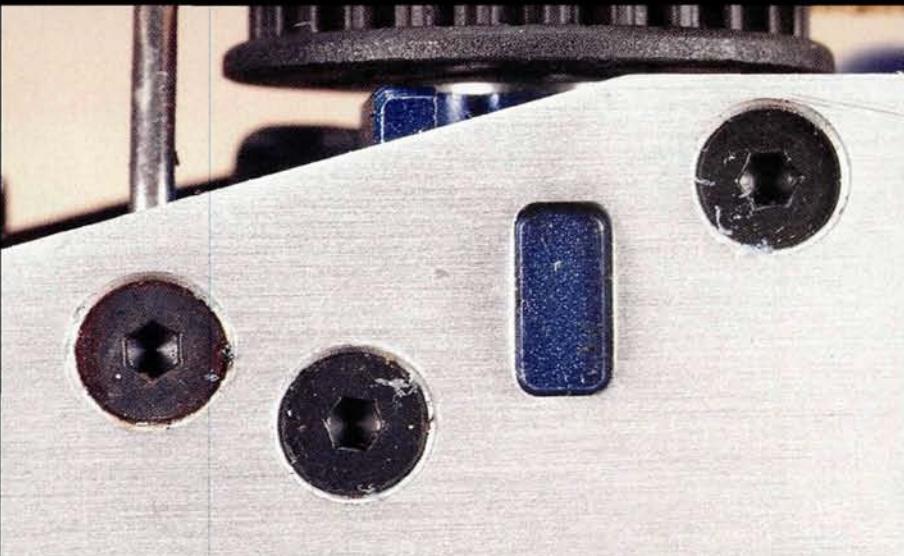
## 4 DRIVE CUP WEAR PREVENTION.

Are you tired of wearing out drive cups on your nitro car? Apply a little grease to the pins of the CVD or universals. It really helps to reduce drive cup wear. Find a nice "sticky" grease that won't "fling" off (I like black moly lube, such as Team Associated's black grease). After every couple of runs, it's a good idea to check that the cup isn't gathering dirt.



## 5 CONVERT TO HEX-HEAD SCREWS.

I really don't like to deal with Phillips-head screws when I know that hex-head screws are so much easier to use. When putting metric screws into plastic, you can use 4-40 hex-head machine screws without a problem. This gets rid of the Phillips-head screws and makes your car look really cool. Also, don't be afraid to put a drop of CA on the threads when threading into plastic. It works great to help the screws bite into the plastic and, contrary to what you might think, isn't permanent.





## 6 SAVE WEIGHT WITH ALUMINUM HARDWARE.

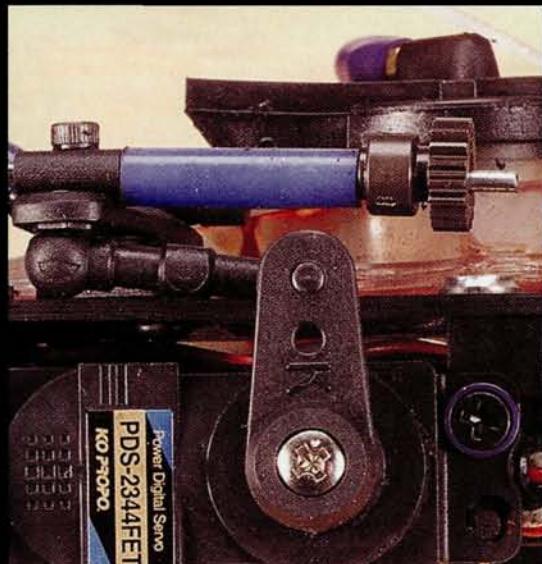
Don't be afraid to use aluminum hardware on nitro sedans. Servos are a great place to use aluminum screws because of the way the servos are mounted. The servo mounts and servo-savers prevent stress from being applied directly to the screws. Using aluminum parts is a great way to save weight. You can also use aluminum screws when securing the fuel tank and receiver pack and when sealing the receiver case. If you're really looking to save weight, you can even use the light fasteners to attach parts such as shock towers; just be sure that at least four screws are used.

### PRO TIP

**Don't overtighten screws when you thread them into plastic. Once the head of the screw contacts the part, rotate the screw only another  $\frac{1}{4}$  turn at the most. Most of the plastic used on nitro cars is pretty soft and will strip easily.**

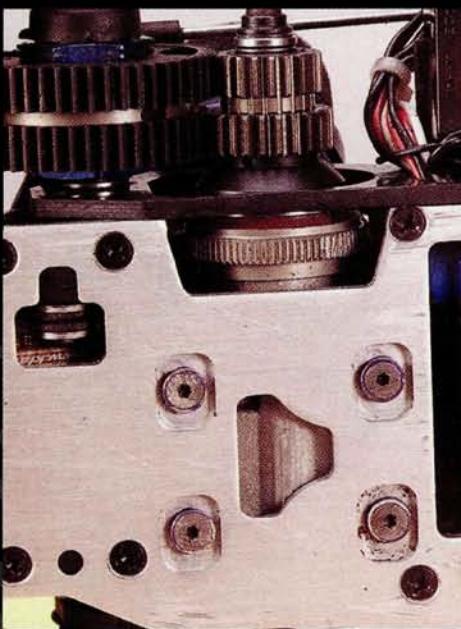
## 7 LOW CG SERVO MOUNTING.

Many nitro cars have the throttle servo mounted upright. Make sure that you mount it as low as possible by putting it under the radio tray—not on top. If it hits the chassis, just grind away the chassis a little until it doesn't. Don't let it touch the chassis because this could lead to premature servo failure caused by vibration. It's all about lowering the center of gravity, and this heavy piece of the car is easy to lower.



## 8 LOWER THE ENGINE.

Speaking of the CG and weight, the engine is the heaviest and tallest equipment in the car, so always make sure that it is as low as possible. If the bottom of the crankcase is more than 1mm off the chassis, look for aftermarket engine mounts that will lower it. After lowering the engine, make sure that the flywheel doesn't stick through the chassis. If it does, you'll have to install a smaller one. Most aftermarket engine lowering mounts come with a flywheel if that additional modification will be necessary.



## 9 SAND THE GRAPHITE PARTS.

If you have a graphite radio tray (or any graphite pieces), always lightly wet-sand the edges with 400-grit sandpaper to round them off; then seal the edges with thick CA. This serves two purposes: the graphite won't split as easily, and servo wires and tape won't accidentally be cut when they rub against the edges.



## 10 ZIP-TIE THE FUEL-TANK LID.

This zip-tie trick for opening the fuel tank makes quick pit stops a cinch. Just feed a long zip-tie through the loop on the tank cap and extend it to the back of the car and through a hole in the shock tower. To prevent it from slipping out of the hole in the shock tower, cut the locking end off another zip-tie and slide it over the zip-tie you've looped on the tank. Cut a hole in the body for access to the zip-tie. Now, you can yank open the tank without blocking it with your hand.





## 11 USE A PINION GEAR FOR BRAKE ADJUSTMENTS.

Pinion gears for electric cars make great adjustment knobs for fine-tuning your brakes. This is especially helpful when the brake shoes start to break in and you have to make adjustments in the pits.



## 12 LESS FUEL LINE, SAME VOLUME.

The trick way to run your fuel pressure line is with a volume-increasing canister. This keeps the line as short and direct as possible for that clean, "pro-build" look. These canisters are available from many different manufacturers, or you can use a large fuel filter for the same purpose. Just remove all the unnecessary screens from inside the filter. Your goal is to equal the volume of a pressure line without having to run a foot of tubing all over your car.



## 13 SET THOSE ENDPOINTS PROPERLY.

At the track, one of the bigger mistakes I see that racers have made on their cars is to misadjust the servos' endpoints. Servo endpoint adjustments should never allow excessive binding at the end of the steering or the throttle throw. If the servo binds, it will drain your receiver pack in half the time and can eventually damage the servo. (This is especially true with the new digital servos.) This binding can also prevent the suspension from moving properly, and that will really affect the car's handling.

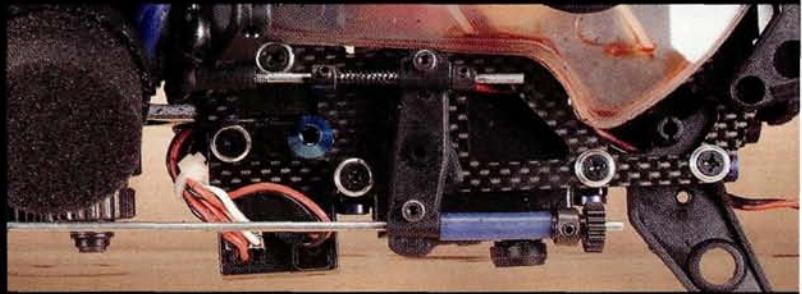
If your endpoint percentages aren't the same on the steering, look at the linkage and make sure that the servo starts at center and that the tie rods are the same length. On the throttle side, too much throw can start to tweak the chassis, especially when the brakes are applied. The latest servos have a ton of torque, and that power can twist the chassis on some of the nitro sedans out there.

### PRO TIP

KO Propo's digital servos can be programmed to shut down if stalled to prevent them from burning out. Pretty cool.

## 14 SERVO LINKAGE SETUP.

Keep your servo linkage perpendicular to the servo arm as much as possible. This allows more linear movement throughout the servo's travel, which is especially important for nitro throttle linkage. The more throw you need to get the brakes to engage, the less "feel" you'll have. Try to keep the movement within the first 45 degrees of movement (or less).



## 15 FUELPROOF THE ON/OFF SWITCH.

Don't be afraid to use a switch just make sure that it's covered with something because if fuel gets inside a switch bad things can happen. A balloon makes great fuelproof cover. Also, make sure that to turn it "on" you have to push the switch forward; that way, the switch won't get turned off in a hard frontal hit.

If you apply any or all of these tips to your preparation for the next race, you'll be sure to have a car that handles better and is more reliable. This will give you much better chance of viewing the trophy girl from up close, instead of from the crowd. Remember, "To finish first, you must first finish."

### SOURCES

TEAM ASSOCIATED (714) 850-9342; [teamassociated.com](http://teamassociated.com).

TRINITY PRODUCTS INC. (732) 635-1600; [teamtrinity.com](http://teamtrinity.com).



# howto upgrade your

by RC Car Action team

## Power up your pistol

There was a time when ready-to-run cars and trucks were strictly beginner-mobiles, but RTRs have evolved into true high-performance designs that make no compromise in performance compared with their kit counterparts. But one area in which RTRs are soundly beaten by kits is radio gear. When you build a kit, you can choose any gear you like. With an RTR, you get no-frills electronics almost every time, even if the car or truck is otherwise a high-performance machine. Team Losi and GS Racing are big exceptions with their JR Racing computer systems, but most other high-performance RTRs could use a radio upgrade. Here's how to swap your AM gear for an FM transmitter/high-torque-servo setup that's more adjustable and will dramatically improve your car's handling and control.



The Airtronics MX-3 and Hitec Aggressor FM are excellent, inexpensive FM systems. Other smart buys include the JR Racing XR3i, Futaba Magnum Junior FM, and KO Propo EX-5 Master.

### CHOOSE A RADIO SYSTEM

You don't need to buy the top-of-the-line model, but do get an FM system so you'll have maximum range and glitch-resistance. Airtronics, Hitec, Futaba, JR and KO are all fine brands with excellent FM systems. We feature the Hitec Aggressor FM (about \$100) and Airtronics MX-3 (about \$150). The Aggressor lacks a computer screen but does have the key adjustments you'll need: dual-rate steering and throttle endpoints. For an extra \$50 or so, the MX-3 adds a ton of features, including an LCD screen, 3-channel operation, steering and throttle endpoints and model memory—plus more stuff we don't have room to list. You can spend a lot more on radio gear (just check out the April issue's "Pro Radio Shootout" for proof), but a "budget" FM system is all you need for high-performance driving.

## step 1

# RC radio system

## step 2

### CHOOSE SERVOS TO SUIT YOUR VEHICLE

There are four things to consider when choosing servos for your vehicle: brand, size, torque and speed.

**BRAND.** If you want servos that are a direct fit in your vehicle, you should choose the brand that has the same spline pattern as your existing radio gear. Airtronics, JR and KO radios all use 23-spline output shafts. Futaba servos have 25-spline shafts, and Hitec servos have 24-spline shafts. The latest Traxxas, DuraTrax, OFNA and HPI RTR vehicles use servos with 25-spline shafts that can be swapped for Futaba servos; most other RTRs include Airtronics radio gear that can be swapped for JR and KO servos (and Airtronics, of course). Some RTRs include spare servo horns to fit servo brands other than those installed in the car, so you can install any servos you like. Even if your kit doesn't include spare horns, you can always use the horns supplied with your new servos. You may, however, need to trim or otherwise modify the horns to operate your vehicle properly, and the servo-supplied horns may not be as strong or as rigid as the kit parts.

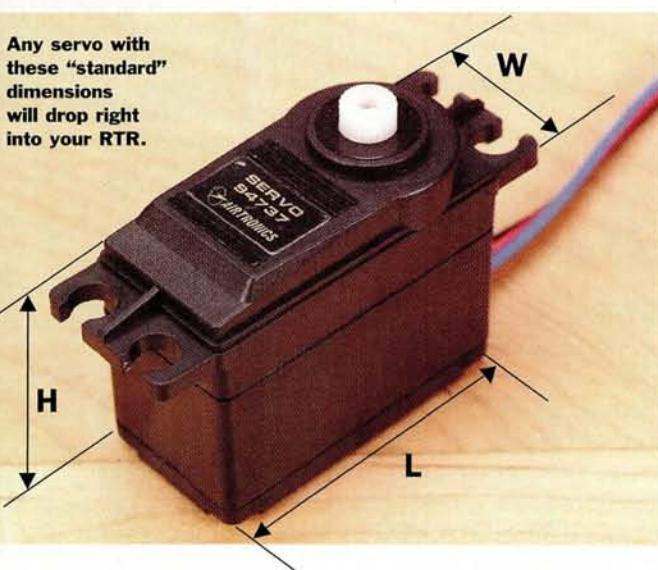
**SIZE.** RTR cars and trucks are designed to accept standard-size servos, so make certain you buy servos that have those dimensions. Most do, but there are some unusual configurations for airplane use that might find their way onto your shopping list. As long as you choose servos that are advertised as "standard size" or are within the following dimension range, they'll fit fine:

Length: 1.5 to 1.6 in. (38 to 40.6mm)

Height: 1.3 to 1.6 in (33 to 40.6mm)

Width: 0.73 to 0.8 in. (18.5 to 20.3mm)

Any servo with these "standard" dimensions will drop right into your RTR.



**TORQUE.** Servo torque is measured in ounce-inches. One oz.-in. is equal to the force generated by 1 ounce acting on a 1-inch lever. If you had a servo with 40 oz.-in. of torque and you installed a 1-inch-long servo horn on it, the servo could lift a 40-ounce weight suspended from the end of the horn. More torque is always better; this chart suggests minimums.

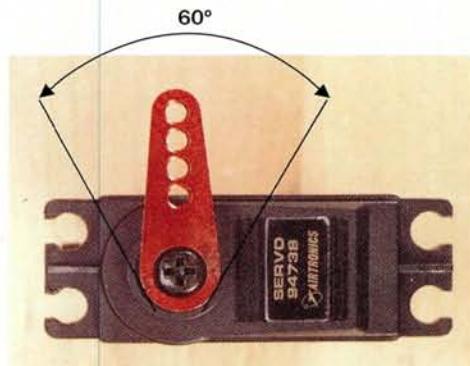
APPLICATION	SUGGESTED MINIMUM TORQUE (OZ-IN.)
Touring car, steering	60
Touring car, throttle/brake*	40
Stadium truck, steering	80
Stadium truck, throttle/brake *	40
1/8-scale buggy, steering	100
1/8-scale buggy, throttle/brake	60
1/8-scale monster truck, steering	120
1/8-scale monster truck, throttle/brake	60

*\*Not applicable if your car or truck is electric, since it will have an electronic speed control instead of a throttle servo.*



In this example, the servo has enough strength to lift a 40-ounce weight with a 1-inch lever. Hence, 40 oz.-in. of torque.

**SPEED.** Servo speed is measured in fractions of a second. The time it takes for the servo's output shaft to rotate 60 degrees is its speed—usually referred to as "transit time." Most inexpensive servos have a transit time of about 0.22 second. High-speed servos can be more than twice as fast at 0.06 second. Shop for torque first and then speed. A "slow" servo might not feel as responsive as a "fast" one, but it won't limit your control of the vehicle. A servo that lacks sufficient torque, however, will make the steering feel mushy and imprecise and may prevent your car or truck from cornering as tightly as possible. If there are various servos in your price range with the torque you need, go for the one with the faster transit time.



The time it takes for a servo to sweep through a 60-degree arc is the "transit time."

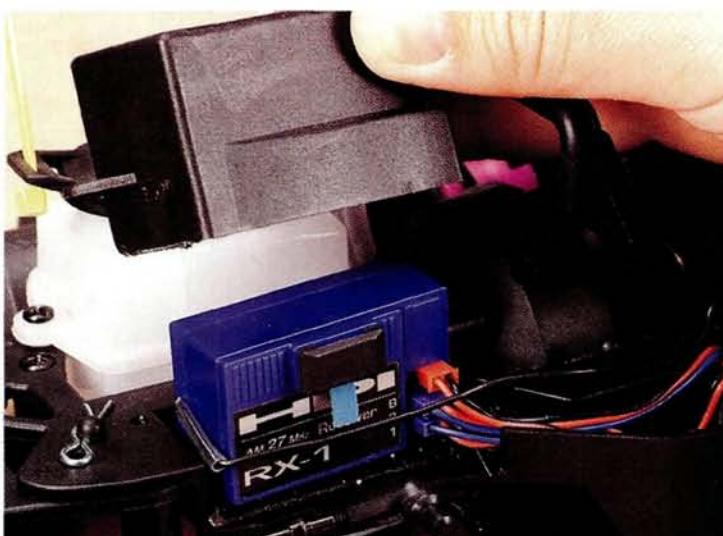
# step 3

**CENTER THE SERVOS** Unpack your new radio gear, and plug the servos into the receiver. Remove the servo horns from the servos, since you use the horns included with your vehicle. Use the included 4-cell AA battery to power the receiver and servos, and then power up the system. Move the steering wheel and throttle trigger to confirm that the servos operate properly; then return the wheel and trigger to neutral. The servos are now centered. Shut off the receiver and then the transmitter. If your radio uses rotary knobs to set trim, make sure they're both set at zero.

Before you install your new radio gear, plug it in, power it up, and test the servos.



# step 4



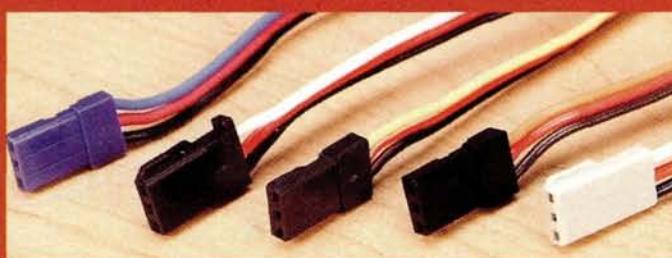
Unplug the servos and remove the receiver first.

**REMOVE THE ORIGINAL RADIO GEAR** Before you reach for your screwdriver, note the orientation of the servos so you can install the new servos properly. Unplug the servos and switch harness from the receiver and remove them. Next, take the servo horns off the servos, but leave the horns connected to their linkages. Now remove the screws that hold the servos, and carefully take out the servos.



Remove the servo horns, but leave the linkages connected. Each servo is held by four screws. Once they're out, the servos can be removed.

## All in the family



From left to right: Airtronics, Futaba, Hitec, JR and KO servo plugs. Note the "fin" on the Futaba and KO plugs.

"Can I mix servo and radio brands?" is a common question, and the short answer is "Yes." All servo brands are compatible with all radio brands. Airtronics servos used to have a nonstandard wiring pattern that required the plug to be rewired for use with non-Airtronics receivers, but since the company switched to its Z-connector, Airtronics servos are completely compatible with all receivers. Futaba and KO servo plugs have a "fin" that must be nipped off before they'll fit Airtronics and JR receivers but are otherwise compatible. LRP, Novak and KO receivers accept Futaba and KO servos without plug modification.

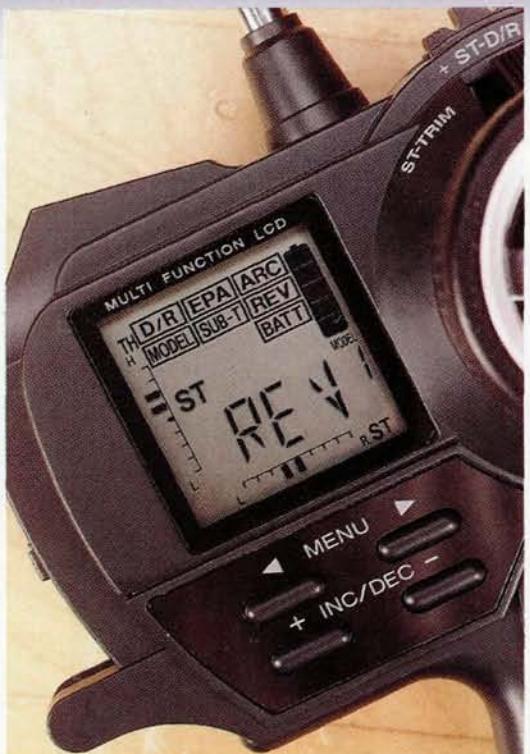


Make sure you plug the servos into the correct channels! Steering is always channel 1, throttle/brake is channel 2.

# step 5

**INSTALL THE NEW RADIO GEAR** If your car or truck includes an assembly manual, follow the steps for servo and receiver installation. No manual? Just reverse the steps you took to remove the original parts. Reinstall the kit servo horns on the new servos, or swap them for the kit-supplied horns that match your new radio gear. Carefully bundle any excess wiring so it doesn't get tangled in steering linkages, drive shafts and belts, or gears. Be sure the steering servo is plugged into the receiver's "channel 1" port and the throttle servo is in "channel 2." Plug the switch harness into port "B" (for battery), and don't forget to uncoil the receiver's antenna wire!

## step 6

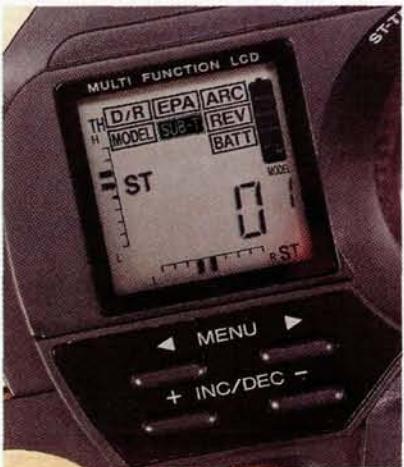


**"REVERSE THE SERVOS, IF NECESSARY** Power up the radio system, and work the steering and throttle to make certain that the wheels steer right when you move the wheel to the right and that the throttle opens when you pull the trigger. If the steering and throttle operate "backwards," all you need to do is flip the servo-reverse switch on the transmitter or access the reversing function on the LCD screen (the manual will show you how).

Each servo can be set for "Normal" or "Reverse." This Airtronics MX-3 shows the steering servo (ST) is reversed (REV).

## step 7

**TRIM THE SERVOS** Now that the servo direction is correct, note the steering and throttle positions at neutral; both will probably be a little off center. Use the radio's subtrim function (the manual will show you how to access it) to precisely set the neutral positions of the servos. If your radio doesn't have subtrim, just use the standard trim function.



**Top right:** the MX-3's subtrim (SUB-T) function allows fine servo centering.

**Bottom right:** radios without LCD screens are trimmed via the usual rotary knobs (arrowed).



Use the endpoint function to prevent the servos from pushing past the travel limits of the steering and throttle linkages.

## step 8

**SET THE ENDPOINTS** When you set a servo's "endpoints," you set the limits of its travel. If you set the endpoints improperly, the servos may try to move the linkages past their limits. This can bend linkages, damage parts (including the servos) and greatly increase the drain on the receiver battery. Your radio manual will show you how to change the endpoint settings via the LCD screen or adjustment dials. To adjust the steering endpoints, turn the steering wheel to the right until the steering linkage reaches its travel limit. Now decrease the endpoint value (for radios with LCD screens), or turn the endpoint dial until you can turn the steering wheel to its stop without causing the steering system to bind. Do the same for the left steering throw, and then repeat the process with the trigger to set the throttle and brake travel.

### ALL SET!

Now that you have high-performance radio gear to match your high-performance RTR, you should notice crisper, more responsive handling, throttle action and braking. You'll also have a lot more adjustability at the transmitter. Experiment with features such as exponential, dual rate and servo speed; they can dramatically change the feel of your car without your having to pick up a wrench. And save your old radio gear: it's the perfect excuse to buy another kit! And then upgrade it.... ■

### SOURCES

**AIRTRONICS** (714) 978-1895; [airtronics.net](http://airtronics.net).

**HITEC RCD INC.** (858) 748-6948; [hitecred.com](http://hitecred.com).

# RACER NEWS

BY THE RC CAR ACTION TEAM

## Ashton's getting married!

Tell your sister to settle down, we're talking about Jason Ashton of Team Mugen, not Ashton Kutcher. Jason met his fiancée Mistie at the University of Nevada in Las Vegas, where they plan to finish school before their big day. Ashton said, "She takes care of me, so I can go out and race the cars. I couldn't be happier." Watch out, Mistie, you guys aren't even married yet, and it's all about Jason.



## SITE SEEING



### wreckedexotics.com

If you wanna see what really happens when that fool who just sold his dot-com stock for millions goes out and buys that \$200,000 Ferrari but can't drive to save his life, then hop on over to [wreckedexotics.com](http://wreckedexotics.com). Here you'll see some of the most appalling examples of why guys who don't know their ass from a gas pedal shouldn't be allowed to drive some of the finest cars on the road today. Telephone pole—1; Ferrari—0.

## BOARD WALK

FROM THE  
RADIOCONTROLZONE  
.COM BULLETIN BOARD

### Servo problems

**TL-01 DUDESS:** My servo breaks a lot. I've been using the regular screws and everything that came with the kit. Why is it breaking?

**STEVEN:** The servo-saver might be too tight or, instead of flexing, it might be sticking when you crash.

**INSPRADGE:** You can buy a better-quality servo with metal gears that will take more abuse.

### How do you clean a heat sink?

**MAN, 15:** While I was cleaning my engine, I wondered what might be the best way to clean off the gunk between the heat sink's fins. Also, do you have any tips on how to clean off the rest of the engine? The stuff isn't really burnt on; it's just difficult to get off, especially from all the small indents in the engine.

**N20SUPRA:** I suggest that you take off the head, dip it in denatured alcohol (denatured, not rubbing alcohol, which might strip the finish). Use Q-Tips and a hobby knife with paper napkins wrapped around the blade.

**PHOTOGUY:** How about using a one-inch paint-brush (without the paint, of course) to "brush" off all the debris? It will work on the engine as well as the entire car.

**BE HEARD!** LOG ON AT  
[RADIOCONTROLZONE.COM](http://RADIOCONTROLZONE.COM)



## MOTORCYCLE RACING IN SIN CITY

The newly formed Racing Association of Motorcycle Modelers (RAMM) is an organization for racers who like to get it done on two wheels. RAMM will host the first USA Motorcycle Championship race at the Silver Bowl on May 15 to 16 in Las Vegas (sponsored by Airtronics USA, Internet-RC Radio Control, Nuova Faor, Crazy Nut Racing and Novarossi). RAMM's goal is to "bring motorcycle modeling and racing to a level in the hobby that it deserves." For more info, click over to [bike.org](http://bike.org) and the official race entry form.



## BABCOCK SERIES A HIT

The Jimmy Babcock Racing Series started off with a big bang. Nearly 200 electric racers participated in the first of the six-race series. Every class has bump-ups, so even the low>Main guys stay for their race for a chance to bump up, and the champions will win very cool prizes, including radios, car kits and a free pass to a professional NASCAR driving school. This series is sure to add to the highly popular electric off-road scene in the SoCal area. If you're interested in racing in one of the events, check out [jimmybabcock.com](http://jimmybabcock.com).

**“**Since this series has been so successful, I may start an on-road series next year.” **”**

Jimmy Babcock on his Jimmy Babcock Racing Series.

# RACER NEWS

## SPEED SHOP



### FULL FORCE RC

#### Carbon-fiber chassis components for the HPI Savage

Full Force RC's Savage combo pack includes chassis plates, all six arm braces and a brake disc. When you use all the pieces, you save 4.4 ounces; the side plates alone knock off more than 2 ounces! All the parts are made of 3mm-thick carbon-fiber plate. Not only are the carbon-fiber parts much lighter, but they're also more rigid, so they flex less than the stock pieces.

Savage carbon-fiber chassis components—item no. SV001; \$100.  
Full Force RC; [fullforrc.com](http://fullforrc.com).



### TRACKSIDE RC PRODUCTS

#### Aluminum screw kits

Trackside now offers complete aluminum screw kits for most popular Associated, Team Losi and Traxxas vehicles. The screws are lighter than factory fasteners and are available anodized in blue, red and purple. The screws are made from 7075 T6 aluminum (that's cold forged) and then anodized for added strength.

Trackside RC Products aluminum screw kits

Item no. varies with model; \$10 to \$23.

Trackside RC Products; [tracksidercproducts.com](http://tracksidercproducts.com).



### PROTECH

#### Vandal stock motor

ProTech's new TOP-based 27-turn, dyno-tuned stock motor is labeled with all the important specs: rpm, power output, efficiency and torque. It also comes with an extra set of silver brushes, so it's ready to race.

Vandal stock motor—PTC327; \$34.  
ProTech (561) 635-9358; [protechmotors.com](http://protechmotors.com).



### TIER 1 MOTOSPORTS

#### Team Losi Triple-XNT hop-ups

Tier 1 has a host of new aluminum Team Losi Triple-XNT hop-ups. First is the front skidplate that protects your truck during head-on collisions with walls and other hazards, and it also doubles as a front mini carrying handle. Next are the aluminum steering knuckles. These clear-anodized parts are made of 6061 T6 aluminum and weigh only 14 grams. Last are the rear aluminum hubs. They are also clear anodized and weigh 22 grams.

Rear-hub carrier set—item no. TL-T1-9003; \$40.

Front skidplate—T1-TL-0024; \$29.

Steering knuckle set—T1-TL-9007; \$40.

Tier 1 Motorsports (877) TIER1RC; [tier1motorsports.com](http://tier1motorsports.com).

### TRACK THREADS

#### TEAM ORION

#### Race sweatshirt and T-shirt

Now you can look like a Team Orion factory pro even if you drive like a guy on "World's Wildest Police Chases." The sweatshirt is black with a blue silk-screened logo on the front, and it comes in sizes up to XXL. The white T-shirt will keep you cool in the summer and features the same blue logo as the sweatshirt.

Sweatshirt—48030/48031/48032 L/XL/XXL; \$20.  
T-shirt—48020/48021/48022 L/XL/XXL; \$40.  
Team Orion (714) 694-2812; [team-orion.com](http://team-orion.com).



# RACER NEWS

## SPEED SHOP



### TEAM SPEEDMIND

#### Star pinion holder with tooth gauge

Team Speedmind's pinion holder can hold up to 11 pinions, and it has a unique built-in measuring device that quickly shows the tooth count of both 48- and 64-pitch pinions (12 to 33 teeth for 48-pitch, and 15 to 45 teeth for 64-pitch).

The tool is machined out of solid aircraft-grade aluminum.

Star pinion holder with gauge—GW038P (purple)/GW038B (blue); \$26.

SpeedMind; distributed by Magma Intl. Ltd. (905) 886-1808; speedmind.ca.

### TEAM ASSOCIATED

#### B4/T4 molded gear cover

Team Associated released this new black molded gear cover for its B4 buggy and T4 truck. The gear cover is more heavy-duty than the stock piece, and it comes with a removable plug so you can easily access and adjust your slipper clutch.

B4/T4 molded gear cover—7460; \$4.

Team Associated (714) 850-9342; teamassociated.com.



### DU-BRO PRODUCTS

#### Nitro Line

Du-Bro's new Nitro Line comes in convenient packages of 2-foot pieces in six colors and is available to help you personalize your vehicle. The tubing is made of high-quality silicone; it won't kink when coiled, and grips fittings tightly. The Nitro Line is also available in 50-foot spools.

Du-Bro Nitro Line—2233 (purple); \$2/2-ft. pack.

Du-Bro Products (800) 848-9411; dubro.com.

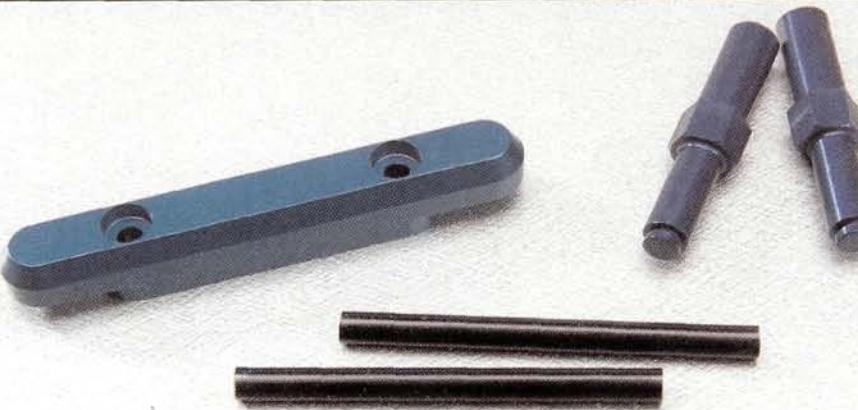
### LUNSFORD RACING

#### Nitro TC3 locking rear turnbuckles

Lunsford Racing has developed a system to strengthen the rear linkage on the Nitro TC3 with its new locking titanium rear turnbuckle setup. The kit comes with two 1 5/8-inch turnbuckles and four, 4mm aluminum nuts.



Nitro TC3 locking rear turnbuckles—2034; \$17.  
Lunsford Racing (541) 928-0587; lunsfordracing.com.



### FACTORY TEAM

#### Trailing axles and hinge-pin brace for B4

Factory Team's new B4 aluminum trailing axles are lighter than the stock pieces and are anodized blue. Material was added to the new front hinge-pin brace (version 2) to make it a little beefier than the stock piece.

Aluminum trailing axle—9665; \$12.

Front hinge-pin brace (version 2)—1585; \$15.

Factory Team; distributed by Team Associated (714) 850-9342; teamassociated.com.



# RACER NEWS

## UNDER THE HOOD

### Jeff Guest's XTM Racing Mammoth

#### RACE: THE DIRT NITRO CHALLENGE

##### EQUIPMENT USED

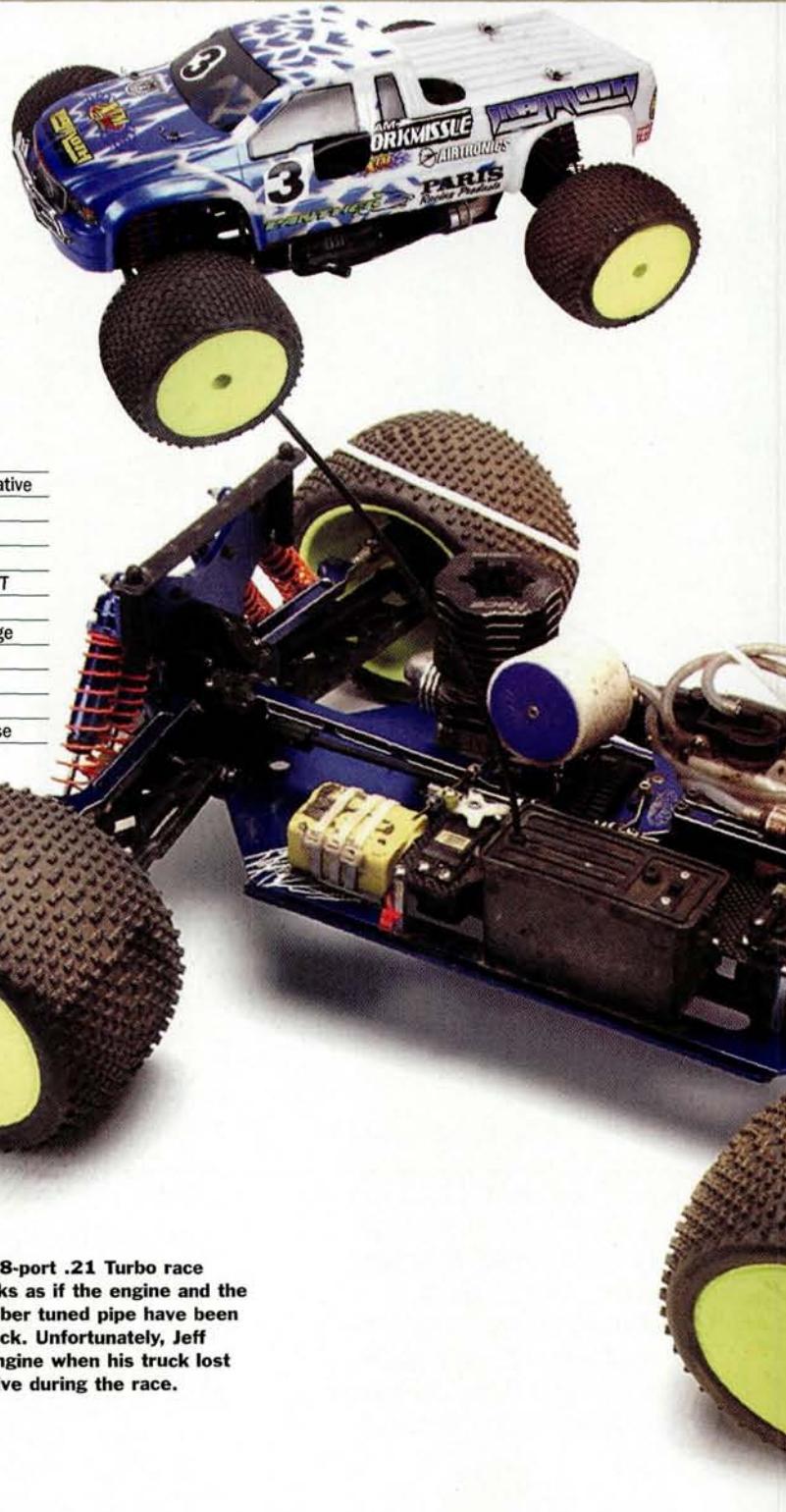
Transmitter: Airtronics M8  
Receiver: Airtronics 92836 FM  
Steering servo: Airtronics 94357  
Throttle servo: Airtronics 94357  
Fuel: Trinity Platinum 30%

Engine: Top 8-port .21  
Glow plug: Rossi turbo no. 7  
Tires: Pro-Line Bow Ties  
Body: Stock Mammoth  
Gearing (1st; 2nd): 65/14; 60/19

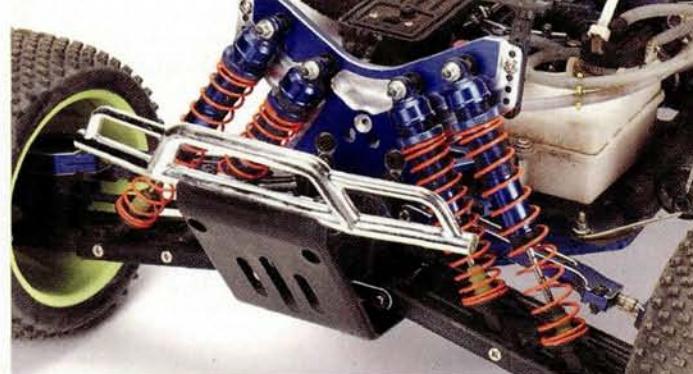
SETUP	FRONT	REAR
Camber	1 deg. negative	2 deg. negative
Toe-in	1.5 deg. out	2 deg. in
Ride height	Arms level	Arms level
Steering link mount	Stock	Stock
Shock fluid (inside/outside)	10WT/20WT	10WT/20WT
Shock piston	Stock	Stock
Shock springs	Stock orange	Stock orange
Shock limiters	Stock	Stock
Shock mount (tower)	Stock	Stock
Shock mount (suspension arm)	Stock	Stock
Diff Grease/oil	Stock grease	Stock grease

##### FACTORY & AFTERMARKET OPTIONS

- 7075-aluminum front and rear shock towers, center diff brace, front and rear torque rods, rear arm mount, front steering knuckles, rear hub carriers and front and rear upper arms.
- Graphite radio tray



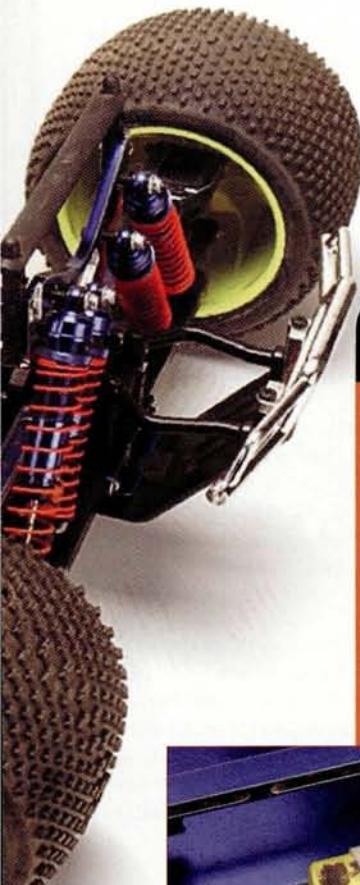
That's a TOP 8-port .21 Turbo race engine. It looks as if the engine and the SH dual-chamber tuned pipe have been to hell and back. Unfortunately, Jeff cooked the engine when his truck lost rear-wheel drive during the race.



Jeff outfitted his Mammoth with a few factory option parts. The shock tower, upper suspension arms and steering knuckles are machined-aluminum for extra durability. The inside shocks are filled with 20WT shock fluid, and the outside shocks are filled with 10WT. The Pro-Line 40 series Bow Ties provided gobs of traction on The Dirt's hard-packed surface.

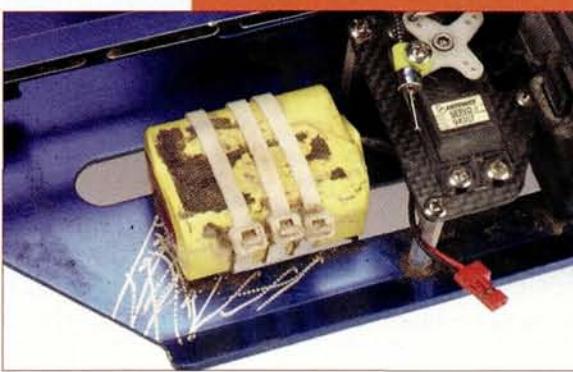


Jeff installed the optional 7075-machined-aluminum shock tower and upper arms on the back of his truck. He replaced the heavy rear skidplate with a compact and lightweight bumper borrowed from his XTM X-Terminator buggy. Look closely, and you can see the aluminum rear arm mount tucked away in front of the bumper.



### FACTORY DRIVER HOT MOD

Jeff mounted the onboard receiver pack directly on the chassis with zip-ties instead of stuffing it inside the battery box. Jeff claims that mounting the battery pack in this position helps to balance everything on the chassis. In case you were wondering, that's a 6V, 1400mAh AA battery pack. More capacity equals more time on the track.



# 5 QUESTIONS



DRIVER: Jeff Guest

AGE: 24

Last big win: 2002 Saturday Series Championship

SPONSORS: XTM Racing, Airtronics, Hotts Mods, Paris Racing, TOP Engines, UFRA, Panther, MIP and Yokomo

WHEN I'M NOT RACING: I manage a Hobby People retail outlet and hang out with friends.

**RC CAR ACTION:** I heard that practice time was severely limited at The Dirt Nitro Challenge, and that many racers had to go into qualifying without much time on the track. How did you dial in your truck without practice time?

**JEFF GUEST:** Yeah, practice time was very limited, but prior to the race, I spent a couple of Sundays practicing. The truck was incredibly dialed, so I didn't change anything for the race.

**RCCA:** There was tough competition in the Pro Monster Truck Class. When did you realize that you had a shot of making the A-main?

**JG:** After the first round of qualifying—when I was running on a TQ pace and lapped the field—I knew I was going to make the show. I was happy and nervous at the same time.

**RCCA:** Did the Mammoth's long wheelbase help or hurt you on the track?

**JG:** The Mammoth's extra-long wheelbase was a definite advantage. I was able to go through the whoops and ruts without even slowing down. Most of the other trucks got tossed around badly in the track's rough sections. Many racers commented on how composed my Mammoth looked. I think we proved that the Mammoth has what it takes to compete with the best trucks out there.

**RCCA:** Your truck had been dominating the competition and was way out in front for the first 10 minutes of the race. Just when it looked as if you were going to run away with the championship, something happened to your truck, and you weren't able to finish. What happened?

**JG:** Yeah, that was such a bummer! My truck had been running awesome, and then the setscrew that secured the rear diff outdrive cup to the diff shaft came loose; that caused all of the power to go to the front wheels. The engine then overheated because of all the wheelspin. We tightened the setscrew quickly, but the engine refused to start. By the time we got the engine going again, the race was almost over. I decided to bite the bullet and not finish the race.

**RCCA:** As the manager of the Orange, CA Hobby People store, when do you find time to practice and race?

**JG:** It's kind of tough to practice when you work six days a week, but I find time on my days off to race from time to time. Fortunately, my boss let me have off three Sundays in a row so that I could prepare for the race. I plan to compete at the Pro-Line Nitro Max Challenge in May; I hope that my boss will feel generous again.

## SOURCES

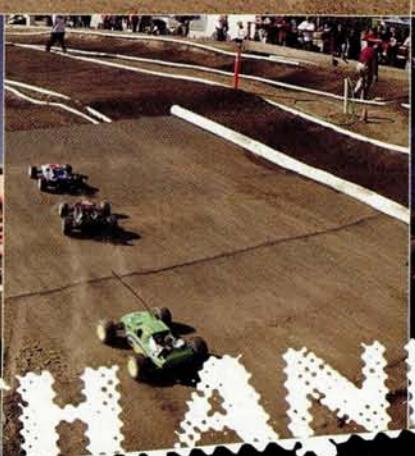
AIRTRONICS (714) 978-1540; [airtronics.net](http://airtronics.net).

PRO-LINE (909) 849-9781; [pro-lineracing.com](http://pro-lineracing.com).

TRINITY (732) 635-1600; [teamtrinity.com](http://teamtrinity.com).

TOP ENGINES distributed by Paris Racing (909) 465-1189; [parisracing.com](http://parisracing.com).

XTM RACING distributed by Global Hobby Distributors (714) 964-0827; [globalhobby.com](http://globalhobby.com).



# MANNA DIRT NITRO

THE DIRT RACETRACK IN HEMET, CA



PHOTOS BY GEORGE M. GONZALEZ

# CAVALIERI BEST IN BUGGY ASSOCIATED TRUCKS DOMINATE CHALLENGE

by George M. Gonzalez

NOW IN ITS FIFTH CONSECUTIVE YEAR, The Dirt Nitro Challenge has blossomed into a premier nitro off-road race that attracts drivers from all over the country. More than 400 racers competed in the 1/8-scale Gas Buggy, 1/10-scale Gas Truck and Unlimited Monster Truck classes to make it a sellout event. IFMAR 4WD Electric World Champ Ryan Cavalieri's big win in the 1/8-scale Gas Buggy class will steal the headlines, but the biggest news came from the Unlimited Monster Truck class where the GS Racing Storm Super Unlimited Truck (SUT), Team Associated Monster GT and XTM Racing Mammoth made their racing debuts.



### 1/10-SCALE PRO GAS TRUCK

Team Losi/Trinity driver Adam Drake used his TQ spot to storm out in front and lead the field around the first few laps. Drake held on to the lead for the first 10 minutes of the race with the help of teammate Ryan Cavalieri, who was riding it out behind him in second. Team Associated's Jared Tebo and Richard Saxton were also on the same lap and looking for a way to get around Cavalieri. A slight bobble put Drake's truck on its lid long enough for Cavalieri and Tebo to sneak by. Drake was now in third place with Saxton all over his tail, and Cavalieri and Tebo battled for the lead. During the remainder of the 45-minute race, the leaders swapped positions many times, and they soon developed a one-lap lead over the rest of the field. In the last few minutes, Tebo edged in front and developed a 10-second lead over Cavalieri to take the win. It looks as if Team Associated will get more mileage out of the "You still can't beat a GT" slogan! Cavalieri and Drake took second and third.



**Jared Tebo accepts the first-place trophy after he won the 1/10-scale Pro Gas Truck A-main.**

### UNLIMITED MONSTER TRUCK

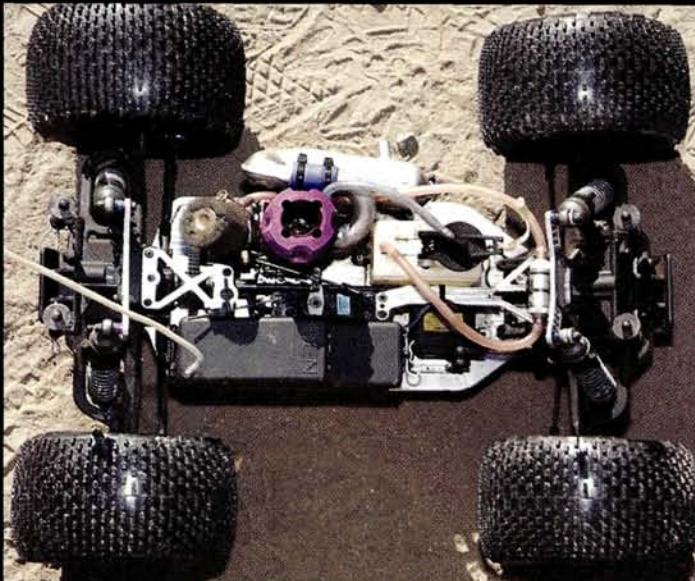
After a rocky start, Jeff Guest's XTM Mammoth got the holeshot, and it took a couple of laps for the drivers to settle into a groove. Since it was a long 30-minute Main, none of the racers wanted to risk breaking their trucks during the first few minutes of the race. Guest was in front, but Richard Saxton's Monster GT and Dean Sexton's JT-converted Mugen MBR-4 were right on his tail. As the race went on, Guest extended his lead by nearly a half lap, and Sexton and Saxton battled it out for second. Guest's lead steadily increased until disaster struck: his truck lost rear-wheel drive because of a loose out-drive cup. He continued to race with front-wheel drive, but before long, his engine overheated and stalled. After leading for the first third of the race, he was finished for the day.

With Guest's XTM out of the race, Saxton found a ton of open real estate and gladly took over the lead, but Sexton wasn't going to let up, and he challenged Saxton for the rest of the race. Sexton's truck was clearly faster as it skied over the triple jumps and flew down the straightaway, but Saxton's truck was more composed in the rough sections of the track, and that gave him the edge. Saxton rolled past the finish line to claim the Monster GT's first big victory, with Sexton's JT/Mugen and Kendall Bennett's Kyosho Inferno conversion in tow.

### 1/8-SCALE PRO GAS BUGGY

It was nearly 10 p.m. when the 1/8-scale Pro Gas Buggy A-main started. The track temperature hovered around 32 degrees, but the wind-chill factor at the top of the two-story drivers' stand made it even colder. At the tone, Thunder Tiger's Richard Saxton got the holeshot and moved around teammate Jared

## NEW IN THE PITS



### JT RACING

Believe it or not, you're looking at a CEN MT2 1/10-scale monster truck. It belongs to CEN driver Mike Walker, and it's outfitted with many JT Racing high-performance parts, including CNC-machined chassis, chassis braces and shock towers. The chassis accepts just about any fuel tank, and the steering servo is mounted flat to lower the CG. The production pieces will have a hard-anodized coating.

**JT Racing (661) 729-4156; [jtracingproducts.com](http://jtracingproducts.com).**

### POWER RACING

Power Racing now offers Titan Tech machined-aluminum shock towers for the Swift RTR 1/8-scale gas buggy. The production units will feature a hard-anodized finish. These are thicker than the stock towers and have been milled out to reduce weight.

**Power Racing (408) 988-1188; [powerracingrc.com](http://powerracingrc.com).**



### DACE MFG.

This machined-aluminum shock tower brace for the Team Losi Triple-XNT provides crucial reinforcement. It comes with all of the necessary fasteners and can be bolted onto the stock shock tower in minutes.

**Dace Mfg. (209) 543-0299; [dacemf.com](http://dacemf.com).**



Tebo, who had the pole. Kyosho's Mark Pavidis and Ryan Cavalieri were on Saxton's tail. As the race progressed, Saxton's lead grew, and Pavidis and Cavalieri battled for second. Just when it looked as if Saxton would run away with another race, he landed hard off a jump and crashed into the fence. With one wheel dangling, Saxton's buggy was out of the race after 39 laps.

Cavalieri took over the lead, and Pavidis found himself fighting for position with Kortz. During the final minutes, Kortz got around Pavidis to take over second place, but Cavalieri had developed an insurmountable 20-second lead. He crossed the line with 86/45:03.67 to win his first-ever 1/8-scale Gas Buggy championship. Kortz rolled in moments later to claim second with an 86/45:30.90. Mark Pavidis took a hard-won third after finishing with an 85/45:06.40.



The 1/8-scale Pro Gas Buggy A-main top three finalists (left to right): Mark Pavidis (third), Jeremy Kortz (second) and Ryan Cavalieri (winner).

## King Richard Speaks

As he wrenched before the Mains, I got some tape-recorder time with The King. Here's Richard on killing time, trucks versus buggies and Monster GT.

**RCCA: Why did you sign up for all three classes?**

**Richard Saxton:** Competing at this event is all about waiting. I have a lot of time to kill between heats, so racing in multiple classes prevents boredom. Besides, the practice time is very limited at this event, so competing in multiple classes gives me more time on the track.

**RCCA: How well do you think you will do in the Mains?**

**RS:** I'm going for a perfect trifecta, so you still have time to call your bookie. I don't know; I should do well, but most of the Mains are taking place in the evening and it gets pretty cold and windy in Hemet at night. I should do OK if I can handle the cold.

**RCCA: So how do you like the Monster GT?**

**RS:** The truck is just awesome! It handles like an 1/8-scale gas buggy and can take a licking. I'm a little outclassed in the horsepower department because most of the A-main drivers have larger displacement engines or full-race engines installed in their trucks. I'll use the stock Thunder Tiger .21 engine that came with the Monster GT. The track will be full of ruts and cracks from all of the racing by the time the Main rolls around, and that will give me an advantage because the Monster GT excels in rough

conditions.

**RCCA: What's the biggest difference between driving a monster truck and a buggy?**

**RS:** You can't drive a monster truck strapped out of your mind like you can with a buggy. Driving a monster truck successfully requires smooth and consistent lines, and you need to roll into the corners instead of driving into the apex. You also have to find a way to make it through the jumps quickly without attempting to sky over them. Other than that, the experiences are very similar.

**RCCA: So who do you think is going to give you the most trouble during the monster truck A-main?**

**RS:** Bob Tillman's JT/Mugen truck looks pretty dialed, and he's the TQ. I'm sure he'll give me hell during the Main. Jeff Guest's XTM Mammoth looks as if it could be a threat, too. I guess I'll just have to wait and see.



## WINNERS

### 1/10-SCALE PRO GAS TRUCK

FIN.	QUAL.	DRIVER	CHASSIS	ENGINE	PIPE	FUEL	RADIO	TIRES
1	4	Jared Tebo	Associated RC10GT	O'Donnell	O'Donnell	O'Donnell	Airtronics	Pro-Line
2	2	Ryan Cavalieri	Team Losi Triple-XNT	Trinity/Sirio	Losi	Trinity	Airtronics	Losi
3	1	Adam Drake	Team Losi Triple-XNT	Trinity/Novarossi	Losi	Trinity	Airtronics	Losi
4	6	Travis Amezua	Team Losi Triple-XNT	Team Orion Wasp	Losi	Team Orion	Airtronics	Losi
5	7	Richard Saxton	Associated RC10GT	O'Donnell	O'Donnell	O'Donnell	Airtronics	INS**

### UNLIMITED MONSTER TRUCK

FIN.	QUAL.	DRIVER	CHASSIS	ENGINE	PIPE	FUEL	RADIO	TIRES
1	4	Richard Saxton	Associated MGT	Thunder Tiger	Associated	O'Donnell	Airtronics	Pro-Line
2	5	Dean Sexton	JT Conversion	O.S. Engines	O.S. Engines	O'Donnell	Airtronics	Pro-Line
3	3	Kendall Bennett	Kyosho Conversion	TOP Engines	O.S. Engines	Trinity	Futaba	Pro-Line
4	1	Bob Tillman	Mugen Conversion	O.S. Engines	Rex	O'Donnell	Airtronics	Pro-Line
5	B*	Garen Hagopian	GS Racing SUT	GS Racing	Fioroni	BK Fuel	Airtronics	Pro-Line

### 1/8-SCALE PRO GAS BUGGY

FIN.	QUAL.	DRIVER	CHASSIS	ENGINE	PIPE	FUEL	RADIO	TIRES
1	B*	Ryan Cavalieri	Kyosho MP 7.5	Trinity/Sirio	Trinity	Trinity	Airtronics	Pro-Line
2	3	Jeremy Kortz	Kyosho MP 7.5	O.S. Engines	O.S. Engines	O'Donnell	Airtronics	Pro-Line
3	4	Mark Pavidis	Kyosho MP 7.5	O'Donnell	INS**	O'Donnell	Airtronics	Pro-Line
4	5	Chad Bradley	Mugen MBX-5	Rex	Rex	Sidewinder	Airtronics	Pro-Line
5	7	Greg Degani	Kyosho MP 7.5	O.S. Engines	O.S. Engines	Sidewinder	Futaba	Pro-Line

\*Bumped up from B-Main.

\*\*Information not supplied by driver.



FOR COMPLETE  
CHART OF  
A-MAIN  
WINNERS  
[RCCARACTION.COM](http://RCCARACTION.COM)

# RICHARD SAXTON'S TEAM ASSOCIATED MONSTER GT

Other than a few factory option parts, Richard's Monster GT is basically stock, which is a testimony to the truck's track-ready handling. Here's the setup Richard used to win the Unlimited Monster Truck A-main. Feel free to steal it.

## SETUP

	FRONT	REAR
Camber	1 deg. negative	2 deg. negative
Toe-in/out	0.5 deg. out	2 deg. in
Ride height	Arms level	Arms level
Shock oil	40WT	40WT
Shock piston	Stock	Stock
Shock spring	Associated red	Associated red
Internal/external limiters	None	None
Upper shock mount	Stock	Stock
Lower shock mount	Stock	Stock



## RACE GEAR

**Transmitter:** Airtronics M8  
**Receiver:** Airtronics 92836 FM  
**Steering servo:** Ace RC DS 1013  
**Throttle servo:** Ace RC DS 1211  
**Fuel:** O'Donnell 30%  
**Engine:** Thunder Tiger Pro 21R (stock)  
**Glow plug:** O'Donnell 99  
**Tires:** Pro-Line Bow Ties  
**Body:** stock  
**Gearing:** 18/52

## OPTIONS

**Factory Team**

- > Machined chassis
- > Side-mount exhaust header
- > Firm red springs
- > Titanium turnbuckles
- > Robo brake disc
- > Aluminum shock bodies
- > Aluminum steering kit
- > 18-tooth clutch bell
- > Forward-only transmission kit

**O'Donnell**

- > Heat-sink head

# GOLDEN HORIZONS

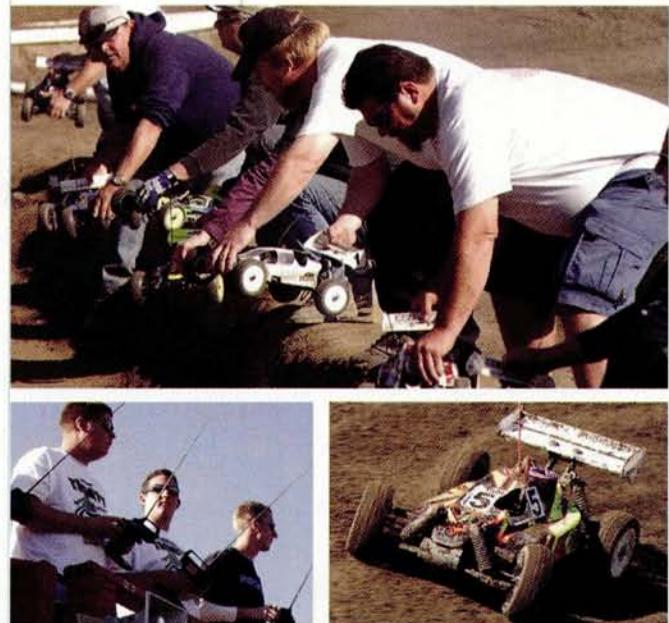
[GHHOBBY.COM](http://GHHOBBY.COM)





## Mini-T Challenge

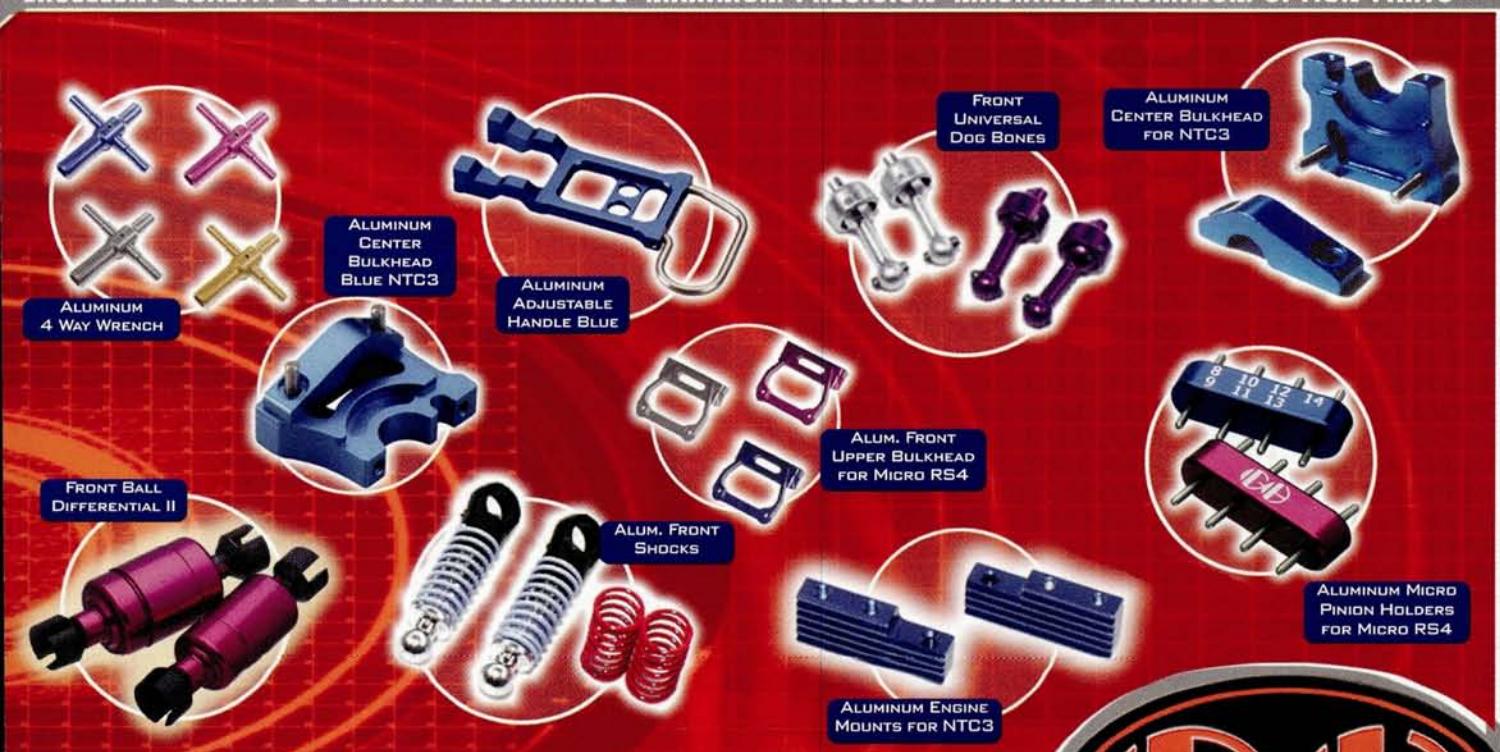
Joey Christiansen, the owner of The Dirt Race Track in Hemet, CA, is well-known for designing awesome tracks, and the layout for the Fifth Annual Dirt Nitro Challenge was no exception. Joey put the same attention to detail into a smaller, 1/18-scale off-road track designed for the Team Losi Mini-T. A special Mini-T Challenge exhibition race was held before the Mains, and several Team Losi drivers battled it out in front of huge crowds of cheering spectators. Judging by all the laughing, I think the drivers had more fun racing the Mini-T trucks than their larger 1/10-scale vehicles. Team Losi is on to something big with these little trucks. Check out [thedirctracing.com](http://thedirctracing.com) for more info on the Mini-T racing class.



### WRAP-UP

The Fifth Annual Dirt Nitro Challenge was an absolute blast. The racing action was intense, the weather was nice (except for the chilly nights) and the track layout was outrageous. Track owner Joey Christiansen and the entire crew at The Dirt Racetrack in Hemet, CA, put on a great show. Congratulations to Ryan Cavalieri, Jared Tebo and Richard Saxton—the newly crowned The Dirt Nitro Challenge champions—for their successes. Hope to see you all there next year. ■

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## GO GO GORILLA

There may not be as much aftermarket gear for Traxxas' innovative electric E-Maxx as there is for its nitro counterpart, the T-Maxx, but there are still plenty of ways to push its performance. The Gorilla Maxx guys are big into the E-Maxx, and with the release of their all-new X-Brace graphite chassis package, they have what has to be the wildest E-Maxx mod so far. The low-profile X-Brace chassis is targeted at hardcore E-Maxx racers, but I decided to give it a unique twist. I wanted to use the racing technology and keep the original monster's element of fun in the mix. I planned to play with the truck in the backyard, yet still be able to make minor changes and take it to the track, too. Hey; if you can't have fun while going fast, how much fun is that?



How dope is that Toyota Land Cruiser body? I think it's one of the coolest bodies for the Maxx.

## Specs

### CHASSIS

#### GORILLA MAXX

- > X-Brace chassis—item no. GMX04-CA; no price yet

### RPM

- > T-Maxx skidplates—80135; \$8
- > T-Maxx bulkhead braces—80155; \$9

### ELECTRONICS

#### AIRTRONICS

- > MX3 3-channel FM radio—90510; \$125

### EPIC

- > Matched 3300 Plus 6-cell packs (2)—EP0017; \$65 each

### JR RACING

- > Z550 servos (2)—JRPSZ550; \$35

### TRINITY

- > Monster Maxx Pro 19-turn single (2)—9247; \$50 each

### SUSPENSION

#### LUNSFORD RACING

- > Ti Monster Springs—7605; \$40

### PRO-LINE

- > Maxx suspension kit—6007-00; \$80
- > Maxx steering kit—6019-00; \$48
- > MIP CVDs for Maxx suspension—6010-00; \$55

### TRAXXAS

- > Big Bore Shocks—4962; \$80
- > Hard-anodized pivot balls—4933X; \$18
- > Aluminum caps for pivot balls (4)—4934X; \$9/pair
- > Hex wheel hubs (4)—4954X; \$18/pack of 4
- > Anodized wheel nuts—4147X; \$6

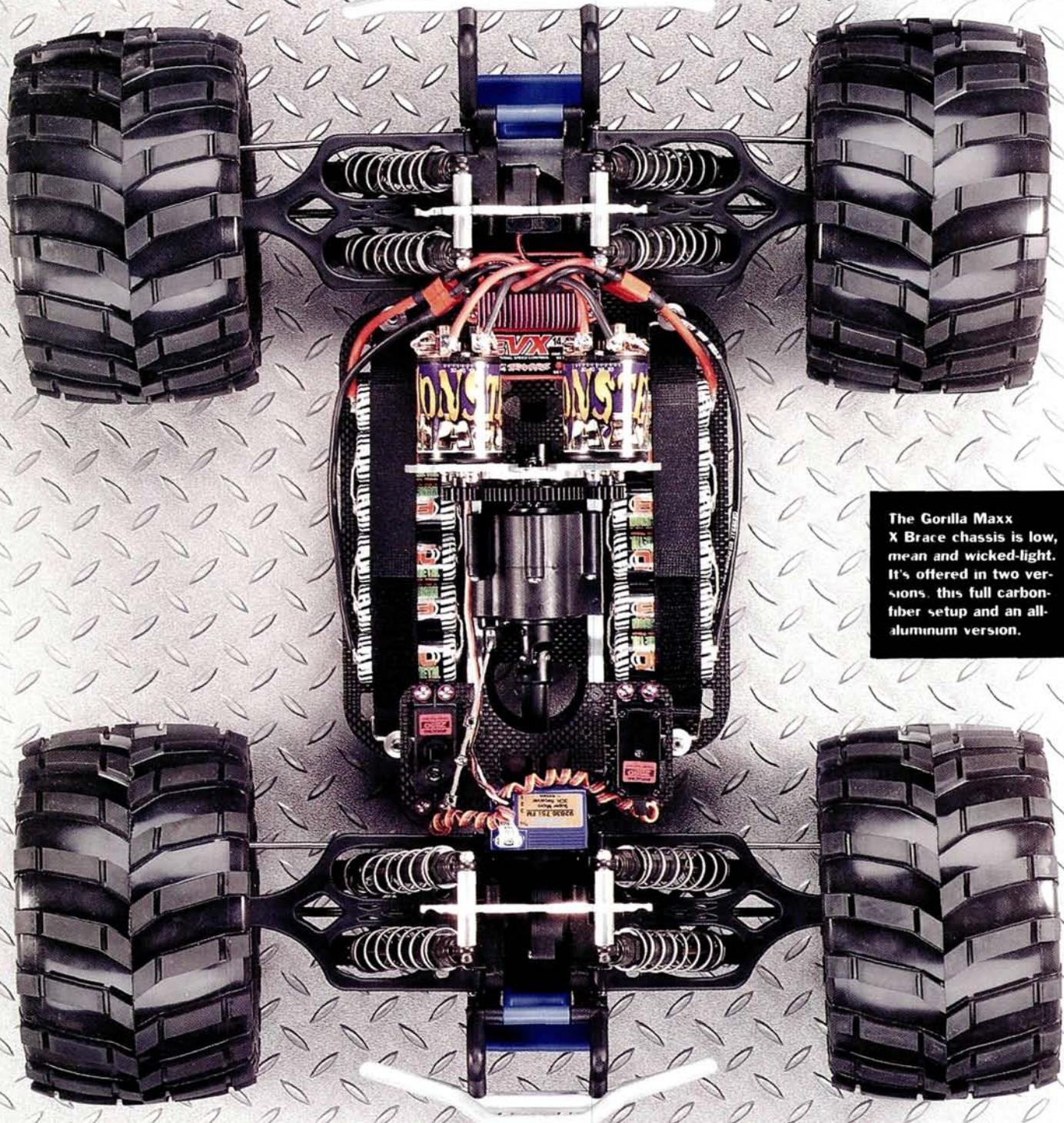
### BODY, WHEELS & TIRES

#### PRO-LINE RACING

- > Masher 40 Series tires—1105-00; \$33/pair
- > Mambo 40 Series wheels—2670-01; \$22/pair
- > Maxx Bumpers—6018-00; \$14/set
- > Toyota Land Cruiser body—3167-00; \$32



I filled the Traxxas Big Bore aluminum shocks with 80WT Associated shock fluid and used Lunsford Ti Monster Springs, which are crazy-stiff and completely up to the task.



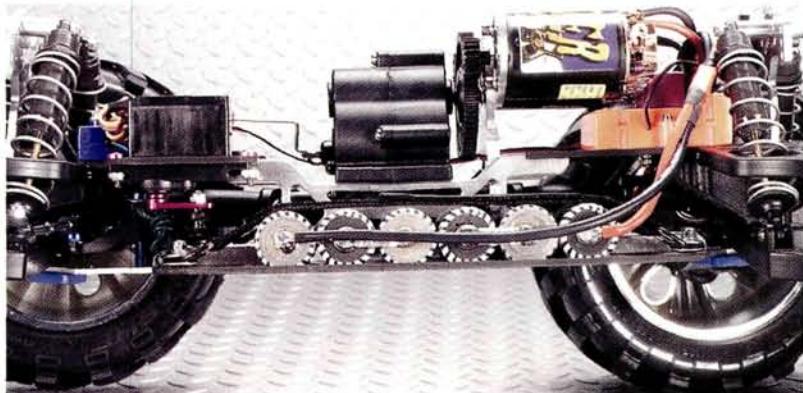
The Gorilla Maxx X Brace chassis is low, mean and wicked-light. It's offered in two versions, this full carbon-fiber setup and an all-aluminum version.

### THRILLA GORILLA

Building the X-Brace chassis kit was a total breeze. The only time I ran into a hurdle was when I mounted my ESC. The way the motors are positioned makes it really difficult to mount the ESC without hitting its heat sink against a motor can. I solved the problem by mounting the motors a little higher on the mount than I would have liked, but I'll get over it.

Other than that, the rest of the truck went together without a hitch.

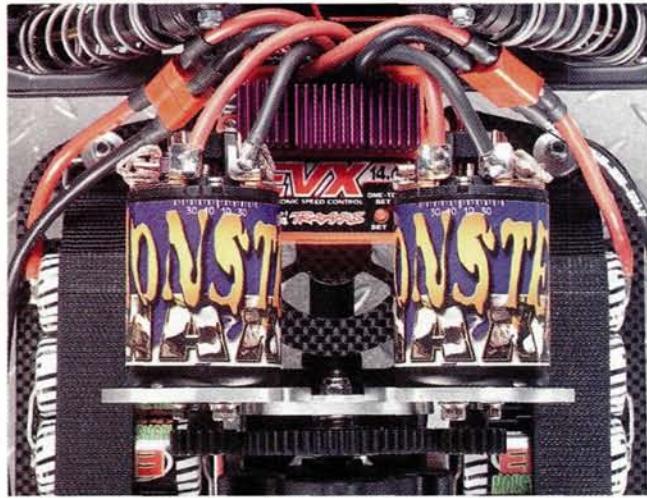
**This side view shows how low the Epic batteries are on the chassis. Looking for a low CG? Grab an X-Brace chassis set and sign up for a limbo contest!**





**Left:** the batteries are held with Velcro-style battery straps. I doubted that they would be held securely enough to take the inevitable bouncing around, but the straps held them like a fat man holds a Twinkie.

**Below:** for racing and fun running, I bolted on a set of Pro-Line's 40 Series Mambo rims with some Maxx Masher skins. When it's time to hit the track, I simply slap on a set of Maxx Bow Ties.



**Mo' power to ya!** When paired with the matched Epic 3300 Plus cells, Trinity's Monster Maxx Pro motors give the truck extra snap.

When it was time to test the beast, I put together a backyard-basher course with a few plastic skateboard ramps thrown in for style points. With its lower CG and Pro-Line suspension, the Gorilla Maxx truck was sure-footed in the corners, and thanks to the Trinity juice, it accelerated like a champ. The Pro-Line Maxx Mashers and Toyota Land Cruiser body made the

truck stand out; that body is just too damn cool.

I'm very happy with how the truck turned out. In its present incarnation, my Gorilla Maxx monster is an awesome backyard beater, and if I ever want to hit the track, I'll just swap the lugs-and-Land Cruiser look for Pro-Line Bow Ties and a Crowd Pleaser shell.

My buddies and I started doing freestyle tricks with our T-Maxx trucks. You should see us! We get some really sick air using plywood ramps and cinder blocks. We want to run our trucks at the local skatepark, but they won't let us. In your mag, we saw pictures of trucks at a skatepark with Wee Man, and we want to know how you guys pulled it off.

Thom Atkinson, Mellville, OH

Well, Thom, you're talking about our sister mag, *RC Nitro*. We hooked up with the Wee Man, Jason Acuna, and schooled him at the Northridge skatepark (Northridge, CA) with our nitro trucks. How did we get in there? Ancient Chinese secret brutha.... Actually, we got special permission for our shoot. It helps to have a celebrity on your team!

Unless you have an "in" with someone who works at the park, you might want to forget about it. I advise you to find a few locals who ride BMX bikes and ask whether they've built any dirt jumps in your area. You may have seen the sort of jumps I'm talking about in X-Games-type competitions—you know, the thin, almost vertical dirt jumps. These types of jump have a few good things going for them: they offer the perfect angle for properly executed backflips; their surface provides great traction; and if you hit them fully woodied, you'll get way more sick air than when you use your plywood ramps.

Thanks for writing, Thom. I called Lunsford Racing and told them about your letter. Luckily for you, they kicked down a set of titanium turnbuckles for your truck. They said you might need them.

## SOURCES

**AIRTRONICS** (714) 978-1895; [airtronics.net](http://airtronics.net).

**EPIC** distributed by Trinity Products Inc. (732) 635-1600; [epicmotorsports.com](http://epicmotorsports.com).

**GORILLA MAXX RC PARTS** (916) 480-2014; [gorillamaxx.com](http://gorillamaxx.com).

**JR RACING** distributed by Horizon Hobby (217) 355-9511; [horizonhobby.com](http://horizonhobby.com).

**LUNSFORD RACING** (541) 928-0587; [lunsfordracing.com](http://lunsfordracing.com).

**PRO-LINE** (909) 849-9781; [pro-lineracing.com](http://pro-lineracing.com).

**RPM R/C PRODUCTS** (909) 393-0366; [rmprcproducts.com](http://rmprcproducts.com).

**TRAXXAS** (888) TRAXXAS; [traxxas.com](http://traxxas.com).

**TRINITY PRODUCTS INC.** (732) 635-1600; [teamtrinity.com](http://teamtrinity.com).



## MADD MAXX OF THE MONTH

This wild contraption comes to us from Andy Tymowicz of Humble, TX. His truck features three, yes three, XTM 24.7 engines for a combined 8hp! Other mods include: a forward-only, steel-gear transmission; a locker rear end; three fuel tanks; and Imex Jumbo Kong tires. Andy tells us that the chassis incorporates a 3-inch extension and has dual steering servos up front. The body is a cool-looking Peterbilt semi with a full lighting kit. Nice work, Andy!



# piston power

expert engine advice

BY STEVE POND

## Big-block power for the T-Maxx

Rarely do I feature an engine in "Piston Power," but rarely does a manufacturer make a new class of engine, especially one that's designed to fit only one vehicle. Economies of scale usually dictate that an engine be made to fit as many vehicles as possible, but with its latest mill, Picco defies that practice. The totally new P2 .21 was designed for one vehicle—the Traxxas T-Maxx. This truck's tremendous popularity created the opportunity for this type of venture.

There are other engines made for the T-Maxx, but the P2 is the first to have a unique block design that ensures it will be used almost exclusively in T-Maxx trucks.

Installing a .21 (3.5cc) engine in a T-Maxx formerly required expensive conversion kits that involved new engine mounts, a stretched chassis and various other accessories. The P2 and its engine mount are intended to be direct replacements for the stock equipment. The 2.5 T-Maxx's stock flywheel, clutch, linkage and exhaust can be bolted directly to the P2—the most simple conversion to a .21 engine.



**The Picco P2 engine is made specifically for the Traxxas T-Maxx. It's a new block size that falls between a small-block and a big-block. It includes an engine mount that allows it to be installed on the stock T-Maxx chassis without any modifications.**

**Engine block.** The P2 is neither a big-block nor a small-block; it's a medium-block—the first of its size. It creates a new category. The engine-mounting holes' unique spacing means that the P2 doesn't fit the stock T-Maxx engine mounts or any conventional small- or big-block mounts; it doesn't have to because it comes with its own cast-aluminum mount.



**The P2 is available in a pull-start version and a version that uses the EZ-Start II from the Traxxas TRX 2.5 engine. If you buy the former, you can install the EZ-Start if you want to because it fits both versions.**



**The P2 features ABC construction with a 3-plus-2 port configuration—three transfer ports and two bypass ports. A long-stroke crankshaft and a nice, milled piston are also part of the deal.**

**The exhaust.** The P2's exhaust flange will look familiar to those who know the TRX 2.5 because it's the same as the TRX 2.5's. It features an O-ring seal and a bolt-on header that make a more stable, secure coupling than you'd get with a conventional rear-exhaust. You can bolt the stock T-Maxx header to the P2 without modification; there's no need to replace the exhaust

## Installing the P2 in your T-Maxx



system. To improve performance, you could upgrade to a more effective header and pipe such as those available from RDLogics and others, but the stock exhaust system will work.

The exhaust flange's internal diameter is 10mm—2mm smaller than that of an average big-block of similar displacement. This might limit the engine's "breathing" at the upper end of its rpm range, but the long-stroke P2 should be well past peak horsepower before this becomes a big issue.

**Crankshaft.** The crankshaft is a short version of an SG shaft. Externally, it's identical to the IPS shaft on the TRX 2.5, so all the stock clutch and flywheel hardware can be used with this engine.

The crankshaft is 13mm in diameter—closer in size to that of a typical big-block. An 8.5mm center crank port feeds the air/fuel mixture into the crankcase. The port's exit is slightly chamfered, but not as much as a typical "turbo" crankshaft's. The very large, 5.5mm, crankshaft rod journal handles the beefy connecting rod and piston. The big difference between this and a small-block crank is its stroke. The P2 crank has a full 16.8mm stroke—identical to that of a full-blown, long-stroke .21.

**The carb's air-inlet shape is similar to the TRX 2.5 carb's, so even the air filter fits the P2. The 6.5mm bore is slightly smaller than is usual in a 3.5cc engine, and it should provide a more snappy throttle.**

**Piston and sleeve.** The chrome-plated brass sleeve has a 3-plus-2 port configuration—three standard transfer ports plus a couple of bypass ports. Holes drilled in the sleeve below the exhaust port retain lubricant that helps to cool the hottest parts of the piston and the sleeve. The milled piston has a couple of extra holes that are part of the bypass ports, and it's also skirted to enhance breathing through the boost port.

**Connecting rod.** A very beefy conrod connects the piston to the crankshaft. It isn't knifed-edged and hasn't been tweaked in any other way, but it



The installation is easy because the P2 was made to use all of the TRX 2.5's stock hardware. You need only a current-generation T-Maxx, or you can buy the parts required to update your Maxx to current specs. Remove its stock engine, and prepare to install the following parts on the new engine in this order: collet, flywheel, clutch nut, clutch shoes and retainer spring, clutch bell bearings, clutch bell, shim and the E-clip that keeps it all on the crankshaft. Make sure that everything has been properly tightened and cleaned.

Next, remove the header and O-ring from the stock engine and install it on the P2 (use the stock screws). Last, remove the air filter from the stock engine, clean and re-oil it, and install it on the P2's carburetor. Now install the P2, using the stock screws and the holes for the stock engine mount.

This engine was made with ease of installation in mind. Certain upgrades, e.g., those to beef up the drive train, might be in order, but nothing extra is required to get rolling.

**It's easy to install the P2 in the T-Maxx. It takes about 10 minutes to complete the swap; just push the tuned pipe to the rear slightly because the P2 sits a little farther back than the stock engine does.**

definitely has bulk on its side. The conrod's only unique feature is that its oil hole is at the side instead of at the front.

**Cylinder head.** Capping off the P2 is a 2-piece cylinder head that uses standard glow plugs. Six head bolts fasten the blue-anodized, 10-fin heat sink and insert to the block.

**Carburetor.** A special 2-needle slide carb was built just for this engine. Its 6.5mm bore is just slightly smaller than a big-block buggy engine's. The smaller bore sharpens low-speed throttle response, and that means better bottom-end throttle response to help push the heavy T-Maxx around.

The carb body is aluminum and molded composite, and parts of the main needle and slide assembly are steel. The venturi inlet is exactly the same shape as it is in the stock TRX 2.5's carburetor, so the stock air filter also fits the P2.

### WRAP-UP

The Picco P2 .21 engine fits only one vehicle—the most popular RC vehicle on the planet right now! Many large-displacement small-blocks are limited in stroke because the block can be made only so wide, so we see bigger and bigger bores. We have a steady stream of high-revving short-stroke engines—a configuration that isn't ideal for heavy monster trucks that need engines with lots of torque. Picco created a block that's just wide enough to accommodate a crank with a stroke of 16.8mm. This is a long stroke even for a full-size big-block, so there shouldn't be any shortage of grunt to get your T-Maxx rolling. In addition, the P2 can be installed without your having to spend extra bucks or make any modifications. ■

### SOURCES

**O.S. ENGINES** distributed by Great Planes Model Distributors (217) 398-6300; (800) 682-8948; osengines.com.

**PICCO** distributed exclusively by Werks Racing (408) 365-1000; werksracing.com.

**RD LOGICS** (626) 810-7797; rdlogics.com.

**TRAXXAS CORP.** (972) 265-8000; traxxas.com.





# 4x4

the truck stops here

BY KEVIN HETMANSKI

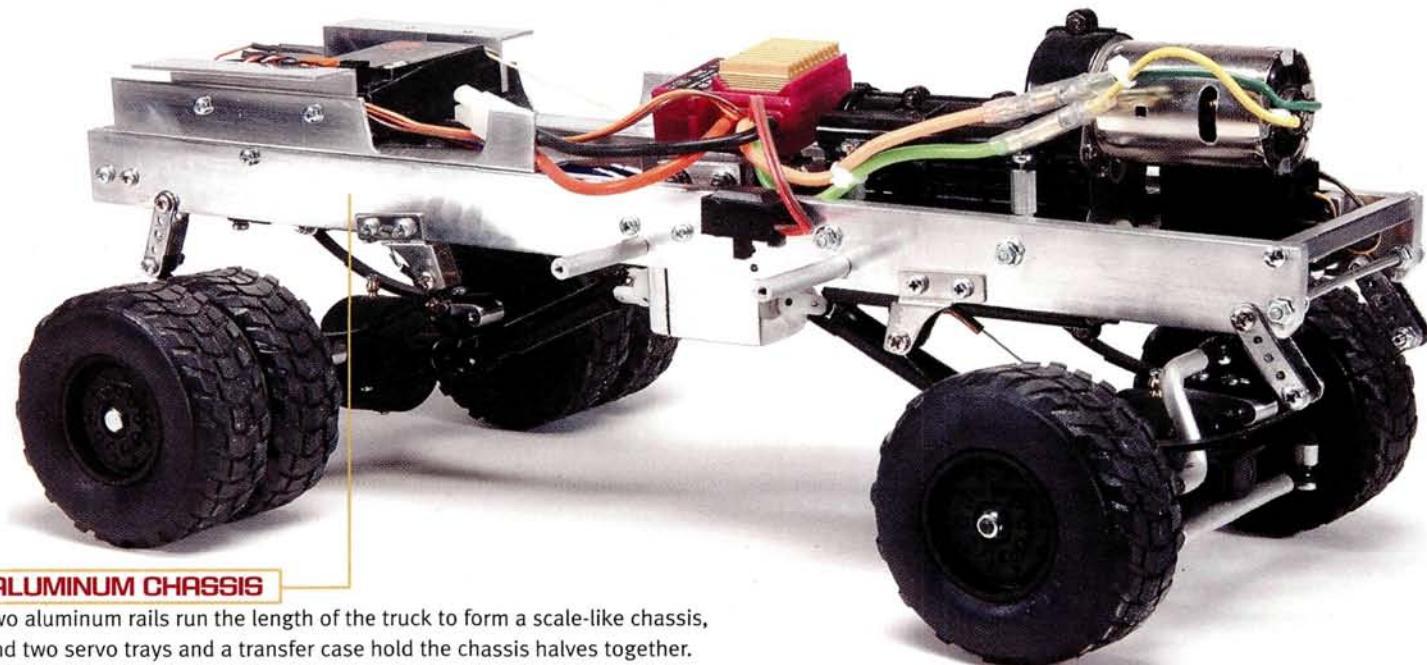
## Homebuilt Super Duty

Sometimes I get an email or letter in the mail from one of our readers telling me about some of the cool project trucks he has built. The super-duty towing rig you see here is one of the better-looking trucks to land in the 4x4 in-box. It was scratch-built by Nathan Myers from Littleton, CO. I called him and convinced him to ship it to me so you guys would be able to get a good look at his creation.



### WORKING FIFTH WHEEL

Nathan was inspired by Tamiya when he built the working fifth wheel that's installed in the bed of the truck. It's constructed out of several pieces of aluminum plate and works like the molded one Tamiya uses for its tractor-truck line. The spring-loaded hook moves out of the way when the trailer's pin enters the wheel; it then locks it in place. A lever attached to the unit allows Nathan to disconnect the trailer.



### ALUMINUM CHASSIS

Two aluminum rails run the length of the truck to form a scale-like chassis, and two servo trays and a transfer case hold the chassis halves together. Nathan polished the rails to give them their bright finish.



### JUGGFOOT?

A Tamiya Juggernaut 2 donated its injection-molded body to the project, and Nathan added some flair (or more literally, "flares") by molding in rear fenders from a Tamiya Blackfoot shell. Mitsubishi Sunset Copper Mica paint gives the completed bodywork its unique color.

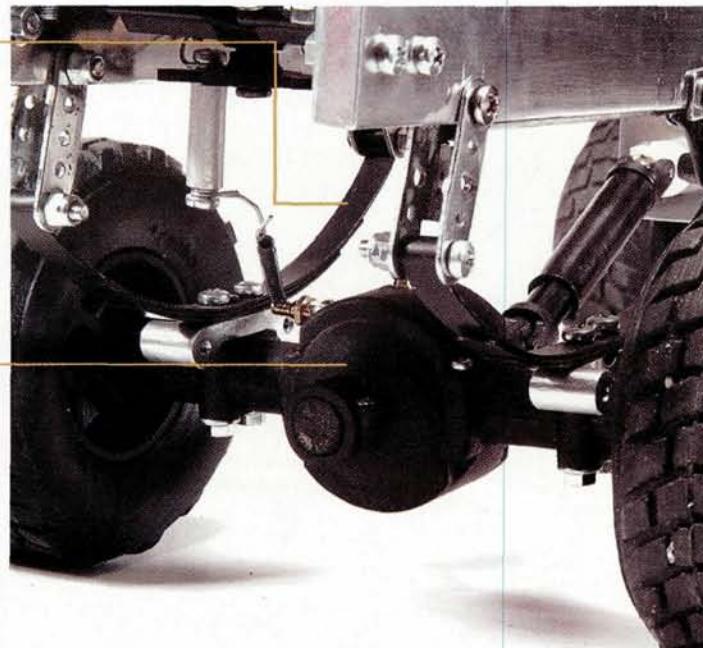
**560**  
BUILD TIME  
IN HOURS

### LEAF-SPRING SUSPENSION

Four Tamiya Juggernaut leaf-springs attach the axles to the chassis and keep them centered. According to Nathan, the truck has a little less than 1 inch of travel, and it can outclimb most monster trucks.

### LOCKING DIFFS

The axles are from Robbe, and they give the truck its super-scale look. A small lever on the outside of the housing locks the diff in place. The Robbe axles are very popular with European truckers who scratch-build their own tractor-trailers.



### TRICK TRAILER

Nathan built a realistic trailer to go with his tricked-out truck. The body is constructed out of a combination of aluminum and ABS sheet plastic, and it rolls on a set of Du-Bro airplane tires. The back door opens, and the pin in the front mates with the fifth wheel on the truck bed. Nathan painted it to match his truck.

### SPECS

**TRANSMITTER:** Futaba 6XAPS

**ESC:** Hobby Mc-Car30

**SERVOS:** Futaba FP-S148 (transmission/axles), Hitec HS303 (steering)

**WHEELBASE:** 11.125 in. (283mm)

**WIDTH:** 9.5 in. (241mm)

**LENGTH WITH TRAILER:** 38.5 in. (978mm)

**RADIO-CONTROLLED FUNCTIONS:**  
Forward, reverse, transmission, locking diff, steering

**TIME TO BUILD:** "It took 560 hours over 21 months to complete both truck and trailer."

**HARDEST PART:** "The transfer case. I had to try many designs before I came up with a design that performed well and looked good. Using only basic shop tools, it was a headache, but the results are well worth it."

**TOTAL COST:** "\$945, but a lot of trading over two years brought the cost down."

**3-SPEED TRANNY**

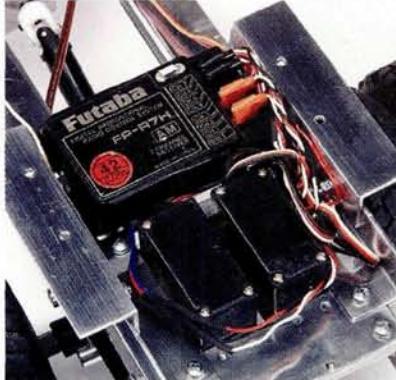
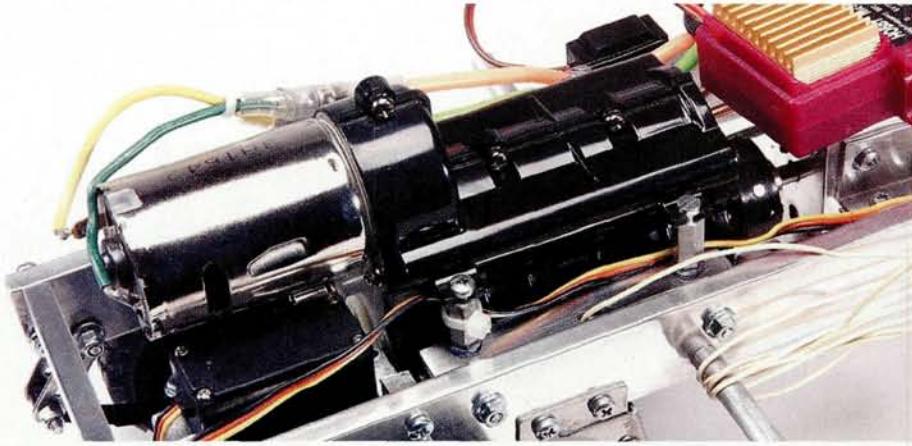
A Tamiya 3-speed transmission provides Nathan's project with a good amount of get-up-and-go. It's the transmission that's used in Tamiya's line of tractor-trailer trucks. The output shaft is connected to a custom-made transfer case.



facture the parts. The housing started out as a solid chunk of aluminum, and Nathan removed material from the center using a drill press and a rotary tool. Once the housing had been hogged out, Nathan installed a set of 32-pitch gears to transfer output power to the center drive shafts.

**HANDMADE TRANSFER CASE**

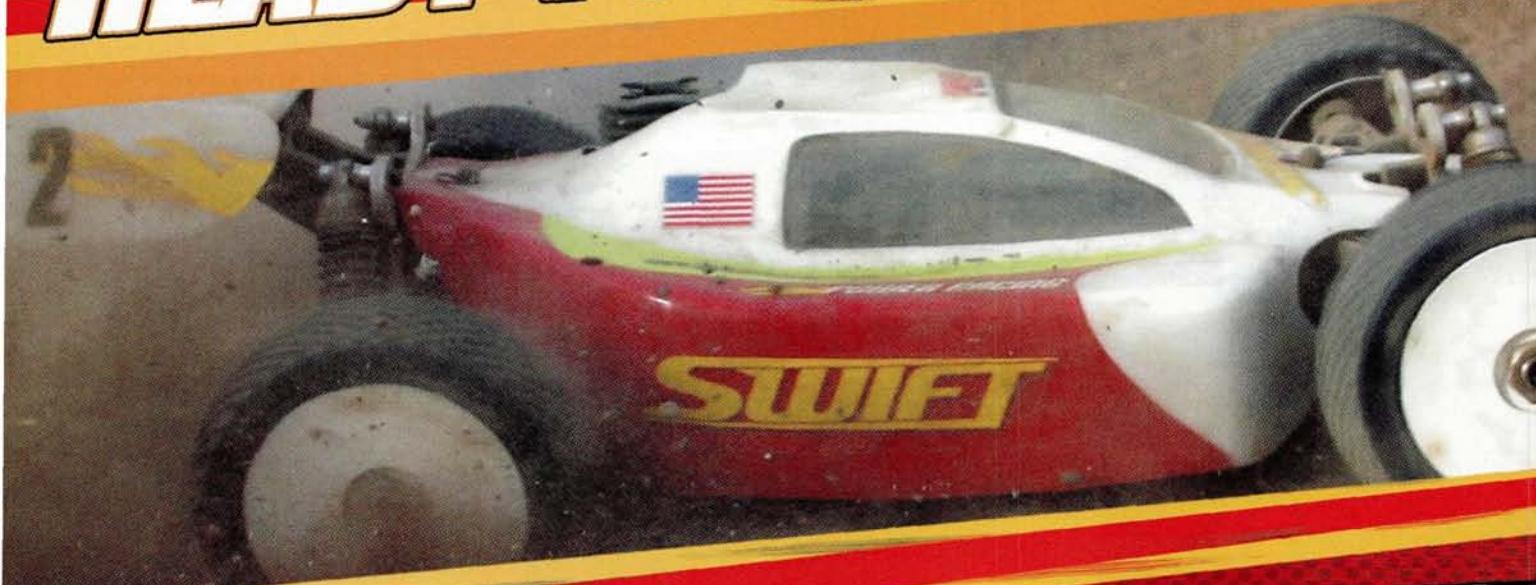
According to Nathan, the transfer case was the hardest part of the truck to build. He had only basic tools in his shop to man-

**6 CHANNELS OF CONTROL**

A Futaba 6XAPS 6-channel radio controls the rig, and it was converted to 75MHz from 72MHz. Believe me; just like you, I wondered why this guy needed so many channels. Along with the usual steering and throttle control, the Futaba transmitter commands the truck's 3-speed transmission and can lock

and unlock the front and rear differentials independently.

# READY TO ROOST!



# SWIFT

READY-TO-RUN 1/8 NITRO BUGGY

# TRICK TRUCK STUFF



As you can see, Nathan's 21 months of work paid off. This truck looks as if someone took a shrink ray to the real deal. Great job, Nathan! I hope this inspires some of you to build your own custom creations. Send your pics to "4x4."

## SOURCES

**DU-BRO PRODUCTS** (800) 848-9411; [dubro.com](http://dubro.com).

**FUTABA** distributed exclusively by Great Planes Model Distributors (217) 398-6300; (800) 682-8948; [futaba-rc.com](http://futaba-rc.com).

**GOLDEN HORIZONS** (604) 331-2526; [ghobby.com](http://ghobby.com).

**TAMIYA AMERICA INC.** (800) 826-4922; [tamiyausa.com](http://tamiyausa.com).

**TEAM ASSOCIATED** (714) 850-9342; [teamassociated.com](http://teamassociated.com); [rc10.com](http://rc10.com).

**TRAXXAS CORP.** (972) 265-8000; [traxxas.com](http://traxxas.com).

## TALK TRUCK!

Send your "4x4" questions and comments to  
Kevin Hetmanski, [kevinh@airage.com](mailto:kevinh@airage.com).



### GOLDEN HORIZONS aluminum parts for Associated Monster GT

The Golden guys wasted no time in designing and manufacturing parts for the Team Associated Monster GT. These direct-replacement parts are CNC-machined out of aluminum billet, fit perfectly and are available in blue and clear anodizing. Setscrews keep the hinge pins in place even if the E-clips fall off, and the heat-sink heads feature a removable blue-anodized top. If you scratch it, just replace the top ring instead of the whole head. All the parts come with the hardware necessary to install them.

Steering block—02456 (blue), 02457 (silver); \$40

Lower arms—02454 (blue), 02455 (silver); \$38

Upper arms—02452 (blue), 02453 (silver); \$35

Heat-sink head—02451; \$35

## THINK INSIDE THE BOX:

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**Machined aluminum chassis braces**

**Competition .21 engine w/pullstart**

**Hardened CNC-cut steel gears**

**6 chrome plated hardened CV-Joints**

**Threaded aluminum shocks**

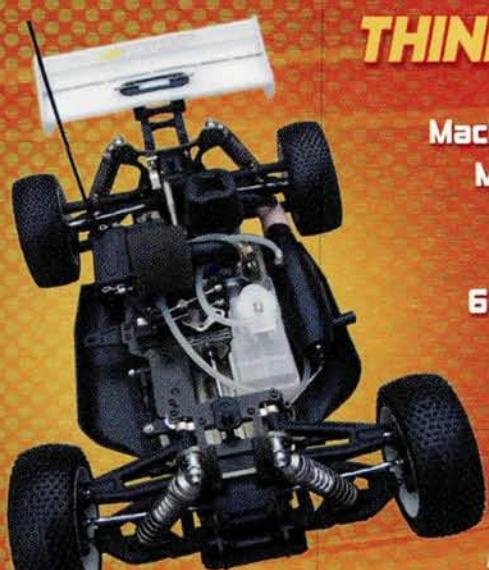
**Carbon fiber upper brace**

**Carbon Fiber low-CG radio tray**

**Glow igniter and fuel bottle**

**Pre-cut, pre-painted body**

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prototype shown



# body shop

secrets from the paint booth

BY JOSHUA THIEL



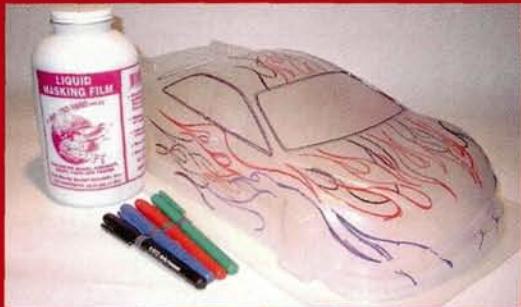
## Fantastic flames

Without a doubt, flames are a sure-fire way to make your ride look hot. Whether on a buggy, sedan or monster truck, flames always look good. If you've already mastered painting basic flames, you may be looking for new tricks to give your next flame job that extra sizzle. Overlapping flames are one variation that is sure to add a great sense of depth and action to flames. Pull up a chair, while I break down the secrets and tricks to painting wild, multilayered flames.

### body prep

As always, I start with a clean Lexan shell—in this case, a new Protoform Mazda 6 sedan that has been gently washed in soap and water. For masking, I've chosen Bob Dively's Liquid Masking Film, which has

been slightly diluted and sprayed onto the body in three solid coats using an airbrush. Once dry, the liquid mask will be cut out in appropriate sequences as I paint the flames. As an option, masking tape can also be used; simply apply large sections of tape to the body and then cut and paint as needed. For this project, I used an airbrush to spray Parma Faskolor paint. Even though an airbrush will ultimately produce better results, all the techniques outlined here can be accomplished with spray cans.



After the three coats of liquid masking had dried, I used permanent markers to draw a layered flame pattern on the outside of the body. The different colors are very helpful in separating the flame segments.

### The groundwork



I cut out and removed the first flame layer of liquid masking prior to painting. I completely painted each flame section in a sequence of fluorescent red, orange and yellow, and then backcoated with white.

body and trace the design on the outside or cut out the flame design and then hold the paper to the outside of the body and trace the design. In terms of overlapping flame designs, there are three main effects you may want to incorporate.

- Simple flame-tip overlap. This is the easiest to create, as only the tips of the flame section crisscross each other.
- Overlay entire flame licks. Because the entire flame section consists of crisscrossing flames and overlapping sections, this requires a lot more planning and work.
- "Negative" flames. This effect uses flames of different colors that jut into the body of a primary flame section.

The first step of the actual painting process is to draw a flame pattern onto the outside of the body using a permanent marker. I draw directly on the Lexan because even the permanent ink is easy to remove after all the painting has been completed. This design will show through the masking and will serve as a guide for cutting. After I get my first design down, I remove any sections I don't like with rubbing alcohol and then redraw them. If you find this process difficult, try drawing a series of flames on paper. You can hold the pattern inside the

# building the fire

The various elements of overlapping flames often look very complex, but they can be simply dealt with by carefully planning the sequence in which a flame is painted. The main challenge is how to differentiate one flame segment from another, especially when they are the same color. One method I use is to add pinstripes (which are just a thin border) around all of the flames; however, other details regarding shading and shape are still needed to complete the effect.



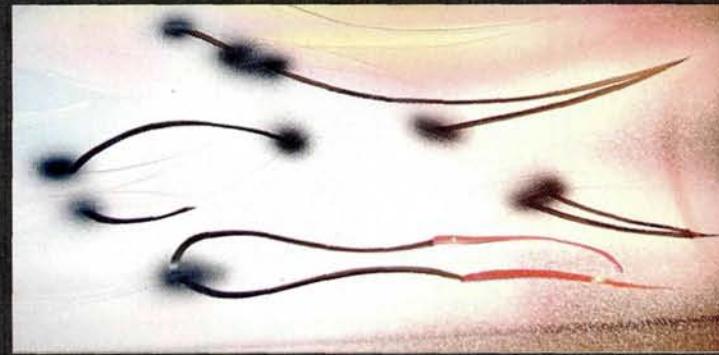
After I had painted the first layer, I cut a  $1/16$ -inch pinstripe along the edges of the flames but did not remove it. I cut the next layer of flames in the same way and painted and trimmed them out with pinstripes. Notice how borders are created in overlapping sections with the pinstripes.

**STEP 1.** Carefully look over the design you created and identify the flame elements that are to be in the foreground and paint those first. Those sections will be on top of the other sections as you look at the completed paint job from the outside. The background sections will be painted last. Using a no. 11 hobby-knife blade, cut out the foreground flames by tracing along the design outline. Then remove the masking from those sections for painting. By painting the flame body first, you can then use the painted edges as an easy-to-see guide for cutting out pinstripes later.

That sounds easy enough, but things get complicated when flame sections overlap. This is where having pinstripes will help, so be sure to leave an appropriate-size gap along the edges of flames that butt up against each other. If you don't want to add pinstripes, you can just link these flame sections by partially removing the mask and shading in the area to differentiate the flames. Before you start to cut, be sure that you have a clear idea of where and which elements you'll paint.

**STEP 2.** When it's time to actually paint the flames, look carefully at the design and identify the sections that will need to be a different color from the surrounding flames. Consider this for all the flame sections that you'll paint. In sections that have a solid piece of masking within adjoining flames, take care to achieve a color fade that separates the two. If possible, remove only a portion of a masked section, or tightly control the amount of color you apply to the desired area.

**STEP 3.** After the first foreground sections have been painted, cut the pinstripes around those areas, but do not remove the masking from the pinstripes. These will be painted later. To create pinstripes, trace and cut  $1/16$  to  $1/8$ -inch-wide lines along the previously painted flames only. Next, cut out the pattern of the underlying background layer of flames, and then paint these flames in the same manner as you did the first. Also add pinstripes around these areas, but again, don't paint them until you have completed all successive layers of flames.



Remove underlying layers of pinstripes in sections where they butt against overlying layers. At these junctions, you can add a small burst of black to serve as a shadow.

**STEP 4.** At this stage, you should have a series of painted flames with unpainted pinstripe borders, many of which will directly butt into one another. To further separate adjoining pinstripes, add a shading layer of color at intersections of overlapping stripes. Do this by first removing what would be seen as the bottom layers of pinstripes, and leave the adjoining upper sections in place. Next, spray in a dark shadow color at pinstripe intersections. Then remove and paint all remaining sections of pinstripes.

Another method of distinguishing flame licks is to just separate the overlapping licks. Instead of having the flames and surrounding pinstripes actually touch one another, leave a  $1/16$ -inch gap between the flame licks.

## Finishing touches



I finished the remainder of the body in a basic red, orange, yellow and white fade. Look closely to see where and how the various pinstripes were painted and how they can be used to highlight flame segments.

After the flame graphics have been completed, you can finish the remainder of the body by applying any additional graphics. To give the flames more depth, add drop shadows. These are made by spraying a dark color, in uniform faded lines,

alongside all of the flame licks before you paint the main background color of the body. Also, I decided to add a little more eye candy and incorporated even more underlying graphic layers beneath the flames.

This is just one example of the many uses of shading, stripes and spaces that you can use to add hot-looking detail to flames. In any case, make sure that you work out a process for what and when to paint, and you'll be sure to turn up the heat the next time you paint flames. Keep the paint spraying and your creative juices flowing!



With all of the flames and pinstripes now painted, add drop shadows by spraying tight faded lines alongside the trailing edges of the flames.

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# bodyshop

## In the zone



Each month, RC Car Action's super online resource, "Radio Control Zone," hosts an online painting contest. The winner gets to show off in "Body Shop." Click over to [radiocontrolzone.com](http://radiocontrolzone.com) for the submission rules. Maybe we'll see your work here!

This month's featured winner is Froilan Lirio of Baldwin Park, CA. To create his unique paint design, Froilan used a blunt X-Acto blade to scratch out the ultrathin lines. He then painted over the marks with Parma Faspearl Blue and backed them with Aclad II chrome. Looks good, Froilan!

## new in the shop

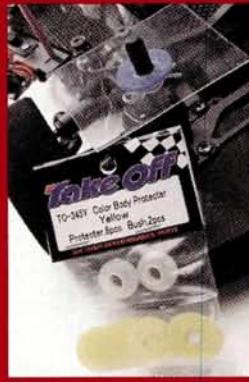
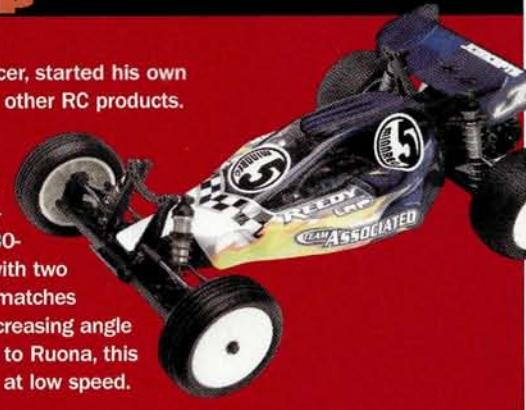
### J-Concepts Illuzion B4 body

Jason Ruona, Team Associated factory racer, started his own company that produces racing bodies and other RC products.

He dubbed his company J-Concepts and offers a new shell, the Illuzion, for the B4.

The new body is designed to add a unique look to the buggy and to increase performance. The clear shell is molded out of 0.030-inch-thick Lexan. The Illuzion also comes with two wings: one is the standard-style wing that matches the Illuzion's body, and the other has an increasing angle at the rear for more downforce. According to Ruona, this adds more forward bite and some stability at low speed.

J-Concepts: [jconcepts.net](http://jconcepts.net).



### Take Off Color Body Protectors

Take Off Color Body Protectors will help prevent your work of art from splitting around the body posts. The protectors use a self-adhesive, soft rubber disc that attaches to the inside of the painted body. The other piece slides over the body post and is secured with

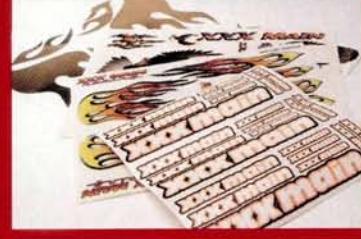
a body clip. With the rubber disc sitting on top of the nylon bushing, impacts are absorbed, and your body doesn't take a beating. Three colors are available: clear (part no. TO-345C), blue (TO-345B) and yellow (TO-345Y).

Take Off; distributed by Schumacher USA (813) 889-9691; [racing-cars.com](http://racing-cars.com); [powers-international.com](http://powers-international.com).

### XXX-Main Racing decals

XXX-Main has a huge selection of colorful decals for the outside of the body. They're printed on clear vinyl, come in a variety of styles, and they are completely fuel-proof. There are just way too many sheets to show here, so take a trip online to check them out. You can order directly from XXX-Main's website.

XXX-Main Racing (877) 744-6793; [xxxmain.com](http://xxxmain.com).



### SOURCES

BOB DIVELY MODELS (201) 804-0077; [bobjdivelymodels.com](http://bobjdivelymodels.com).

PARMA/PSE (440) 237-8650; [parmapse.com](http://parmapse.com).

PROTOFORM INC. distributed by Pro-Line (909) 849-9781; [pro-lineracing.com](http://pro-lineracing.com).

### DETAILING DILEMMA?

Send your Body Shop questions and comments to Josh Thiel at [bodyshop@airage.com](mailto:bodyshop@airage.com).

## Carisma

### M14 Ferrari Enzo

YOU MAY OR MAY NOT RECOGNIZE THE NAME CARISMA, but I'm quite sure the name Ferrari rings a bell for you. After all, who hasn't fantasized about owning one of these fabulous super cars? But alas, a price tag of more than half a million dollars for Ferrari's flagship Enzo prevents the dream from turning into reality—well, for most of us. Now, Carisma aims to make your dreams come true—and for only \$100. The company has unleashed four,  $\frac{1}{14}$ -scale Ferraris in almost-ready-to-run packages. Three GT body styles are available: the 360, F40 and the Enzo tested here. A Formula 1 version is also available for you Michael Schumacher fans.



#### ASSEMBLY

The Carisma M14 comes partially assembled. With only a few basic steps to be completed, you can finish the building in about an hour. Other than the screwdriver and needle-nose pliers required to assemble the car, everything you need is included; Carisma even includes the transmitter batteries.

When you open the package, you'll find the transmitter and a bright red body (the painted bodies all come in the traditional Ferrari red), and underneath are the chassis, electronics and charger. To assemble the kit, you'll have to install the electronics and the rear suspension/motor pod. The electronics consist of a servo hard-wired to a combination receiver and speed control. You also have to attach the wheels and place all the decals. The Carisma cars are officially licensed and superbly detailed; the decal sheet has everything from the windshield wipers to the smallest Ferrari emblem, and the plastic side mirrors add to the high level of realism.

With its numerous body-mount locations, the chassis looks much more complicated than it actually is. Carisma designed the M14 to work with any of the three GT bodies. With independent suspension in the front and a solid axle with a flex-plate for suspension in the rear, the whole setup is similar to what is found on most  $\frac{1}{10}$ - and  $\frac{1}{12}$ -scale pan cars.

The rubber, treaded tires have foam inserts and come glued to authentic BBS rims. Additional tire choices are available as well as other performance-boosting upgrades.

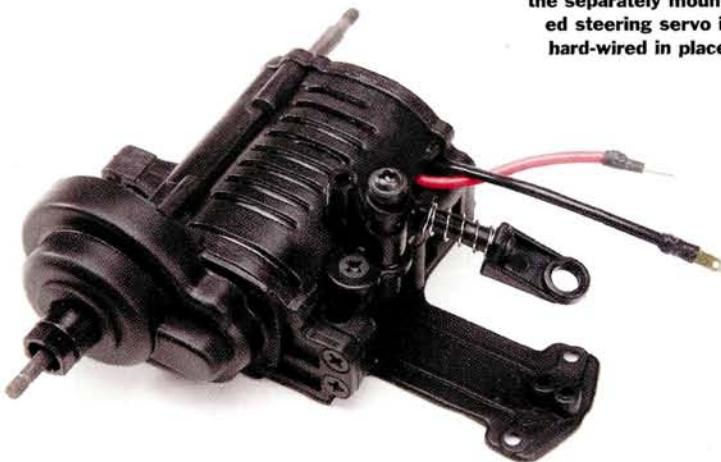


The M14 is quite complete. Besides including a wall charger and battery pack, Carisma even sets you up with the necessary transmitter batteries. You won't find a "batteries not included" sticker on this car's box. The included transmitter is a 2-channel, AM 27MHz pistol-grip unit with steering and throttle trimmers.



Right out of the box, everything is neatly arranged and ready for a quick assembly. The car is a snap to put together; the longest part of the process is slapping on all the cool decals. Hey, take your time. You want your Ferrari to look good, don't you?

Right: the M14's electronics allow fully proportional control of both steering and throttle. The receiver and ESC are one unit; the separately mounted steering servo is hard-wired in place.



Above: the rear pod houses the M14's drive train and a 380 motor. The lower section is a flex-plate that acts as rear suspension. On top, a single coil-over "shock" helps soak up the bumps.



## TESTING

After I had assembled the chassis and applied all the decals, I had to wait for the battery to finish charging before I could see what the M14 could do. The included charger and battery take about three hours to fully charge; it didn't take me nearly that long to put the car together. When the wait was over, I went to the office hallway and ran the car up and down on the carpet. With fully proportional throttle and steering, the M14 drove just like other RC cars. I found the steering a little sensitive—especially considering how fast this car is! That's right; it's fast. It



The Carisma includes a 7.2V Ni-Cd pack and an ultra-simple, plug-'n'-play wall charger. With a dead pack, charging will take about three hours.

isn't going to win the next IFMAR Worlds, but it surprised me and everyone who took the wheel. Considering that it was designed for indoor use, a top speed of 18mph is more speed than it really needs. But extra speed is always a good thing. The acceleration is as good as the top speed, and the brakes are strong and fade-free. The M14 has some on-power understeer, but nothing too drastic; it's really only noticeable when running in tight spaces.

I've had the Carisma for a while, and I've run a bunch of packs through it. I don't have any damage to report other than a few body scrapes. The chassis and suspension designs are simple, durable and require hardly any maintenance. The only maintenance I've done is to blow dust and carpet fibers off the chassis. The drive train and the rest of the car ride on a mix of bronze and plastic bushings; these don't show any signs of wear.

## manufacturer's specifications

Scale 1/14

Wheelbase 7.48 in. (190mm)

Width 5.74 (146mm)

Battery 7.2V Ni-Cd

Motor 380

Differential Bevel gear

Radio 2-channel, AM 27MHz

pistol-grip transmitter

### Factory options

- Ball differential gear
- Graphite upper and lower deck
- Full ball-bearing kit
- R380 racing motor
- Racing tire set
- 1300mAh NiMH battery pack

## VERDICT

The M14 does exactly what it's supposed to do, and it does it well. It's designed to be fun, and it is. It isn't a competitive RC race car, but it isn't a toy either. All of its parts are replaceable, and it has some excellent and very non-toy-like features such as fully proportional control, sick speed and available replacement and upgrade parts. The M14 makes an excellent first car for RC newcomers, and it will satisfy experienced drivers when race day gets rained out. Overall, the M14 is a very good product and an excellent value at only \$100.—Matt Higgins

**Carisma M14 Ferrari Enzo—CIS93368; \$100.**

*Carisma; distributed by Horizon Hobby (800) 338-4639; horizonhobby.com.*

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## ALABAMA

**Mobile Miniature Speedway**, Theodore, Alabama 36582; Richard Sweetser, 251-653-6643; email: [jbogard@comcast.net](mailto:jbogard@comcast.net); web: [mywebpages.comcast.net/bogard](http://mywebpages.comcast.net/bogard)



**Hobby Raceway**, Tuscaloosa, Alabama 35405; Mark or Don Holt, 205-759-4517 & 205-33; email: [makkhol@aol.com](mailto:makkhol@aol.com)



**Oak Mountain R/C Raceway**, Columbiana, Alabama 35051; Matthew Gordon, (205)669-6837; email: [oakmtnrcracing@hotmail.com](mailto:oakmtnrcracing@hotmail.com)



**North Cullman Raceway**, Cullman, Alabama 35055; Daniel Lollies, 256-775-2491; email: [cullmanrchobbies@yahoo.com](mailto:cullmanrchobbies@yahoo.com); web: [www.cullmanrchobbies.home-steam.com](http://www.cullmanrchobbies.home-steam.com)



## ARIZONA

**HobbyTown Raceway**, Tucson, Arizona 85713; Jay, (520) 882-8888; web: [www.hobbytown.com](http://www.hobbytown.com)



**HobbyTown U.S.A.**, Phoenix, Arizona 85044; Doug McFarland, (480) 598-5282



**R/C Sports Mania Raceway**, Phoenix, Arizona 85017; Mike Lubanovich, (602) 278-3671; email: [info@rcsportsmania.com](mailto:info@rcsportsmania.com)

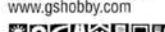


**Scottsdale R/C Raceway**, Scottsdale, Arizona 85251; Scott Anfinson, 480-945-2186



## ARKANSAS

**Grand Slam Hobby**, Ft. Smith, Arkansas 72901; Bryan Shumate, (501) 648-1994; web: [www.gshobby.com](http://www.gshobby.com)



**Sparks R.C. Raceway**, Paragould, Arkansas 72450; Tommy Sparks, (870) 239-3606

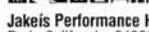


**Alison OffRoad RC Raceway**, Little Rock, Arkansas 72206; Steve Alison, (501) 490-1227; email: [jason@alisonoffroad.com](mailto:jason@alisonoffroad.com); web: [www.alisonoffroad.com](http://www.alisonoffroad.com)



## CALIFORNIA

**Hot Rod Hobbies**, Saugus, California 91350; Jimmy Babcock, (661) 255-2404



**Jakeis Performance Hobbies**, Rohnert Park, California 94928; Jake, (707) 586-3375; email: [jphracing001@aol.com](mailto:jphracing001@aol.com); web: [jphracing.com](http://jphracing.com)



**Racer's Haven Raceway**, Bakersfield, California 93309; Greg Cooper, 661-835-0441; web: [www.racers-haven.com](http://www.racers-haven.com)



**Ripon R/C Speedway**, Ripon, California 95366; Dan Tanis, (209) 599-5160



**Rescue Mini R/C Speedway**, Rescue, California 95672; Bruce Pease, (530) 621-3948; web: [www.innercrite.com/~rcracing/](http://www.innercrite.com/~rcracing/)



**The Dirt Valley R/C Racepark**, Hemet, California 92544; Joe Christenson, (909) 925-7592



**Hobby Central Raceway**, Poway, California 92064; Lee, (858) 513-0373; web: [www.hobby101.com](http://www.hobby101.com)



**Hobby World**, San Jose, California 95129; Guy Bassett, (408) 873-2109



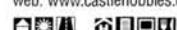
**Capital City R/C**, Sacramento, California 95829; James Patterson, 916-383-3445; email: [capitalrc@hotmail.com](mailto:capitalrc@hotmail.com); web: [www.mhrrc.com](http://www.mhrrc.com)



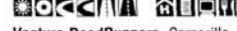
**So Cal R/C Raceway**, Huntington Beach, California 92646; Jim or Lana, 714-963-7484; email: [info@socalrc.com](mailto:info@socalrc.com); web: [www.socalrc.com](http://www.socalrc.com)



**Castle Hobbies**, San Jose, California 95124; Steve Scott, 408-377-3771; web: [www.castlehobbies.com](http://www.castlehobbies.com)



**Showtime R/C Speedway**, Bakersfield, California 93301; Don Risner, 661-328-1481; email: [showtimespeedway@aol.com](mailto:showtimespeedway@aol.com); web: [www.showtime-speedway.com](http://www.showtime-speedway.com)



**Ventura RoadRunners**, Camarillo, California 93010, 805-564-4144; email: [dudebigal@aol.com](mailto:dudebigal@aol.com); web: [www.venturaroadrunners.com](http://www.venturaroadrunners.com)



**Crystal Park Raceway**, Compton, California 90202-4925; James Reese, 310-631-0307; email: [mailto:info@crystalparkraceway.com](mailto:mailto:info@crystalparkraceway.com)



**Delta R/C Raceway & Hobbyshop**, Antioch, California 94509; Rick or Steve, (925) 778-2965; email: [www.deltarc.com](mailto:www.deltarc.com)



**Sacramento RC Racing & Hobbies**, Sacramento, California 95824; Andreas Muller, (916) 424-4001; email: [andreas123@earthlink.net](mailto:andreas123@earthlink.net); web: [www.77sunset.com](http://www.77sunset.com)



**Extreme RPM Hobbies**, Grand Terrace, California 92313; Bobby Haney, 909-370-3379; email: [ExtremeRPMrace@aol.com](mailto:ExtremeRPMrace@aol.com); web: [www.ExtremeRPMracing.com](http://www.ExtremeRPMracing.com)



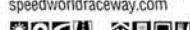
**Pure Adrenaline RC & Hobby**, Sonora, California 95370; Matt, (209) 536-6232; email: [contact@pahobby.com](mailto:contact@pahobby.com); web: [www.pahobby.com](http://www.pahobby.com)



**Paradise Hobbies & RC Raceway**, Paradise, California 95969; David Lafabregue, (530) 877-6447; email: [paradisehobbies@aol.com](mailto:paradisehobbies@aol.com)



**SpeedWorld Raceway**, Roseville, California 95678; Billy Bowerman, 916-783-8864; email: [speeddog@midsync.com](mailto:speeddog@midsync.com); web: [www.speedworldraceway.com](http://www.speedworldraceway.com)

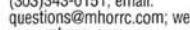


**Palm Desert OffRoad R/C Raceway**, Palm Desert, California 92260; Bob Barrett, 760-341-5699; email: [htupalmdesert@msn.com](mailto:htupalmdesert@msn.com); web: [www.hobbytown.com](http://www.hobbytown.com)



## COLORADO

**MHOR R/C Raceway**, Aurora, Colorado 80011; Jess A. Brockman, (303)343-0151; email: [questions@mhrrc.com](mailto:questions@mhrrc.com); web: [www.mhrrc.com](http://www.mhrrc.com)

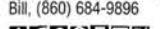


**Valley West Off-Road RC Club**, Grand Junction, Colorado 81504; Jodie Grein, 970-242-1412; email: [geerhed@gj.net](mailto:geerhed@gj.net); web: [www.gj.net/~geerhed/worcdind.html](http://www.gj.net/~geerhed/worcdind.html)



## CONNECTICUT

**K&N R/C Speedway Inc.**, Stafford Springs, Connecticut 06076; Jim or Bill, (860) 684-9896



**Manchester Hobbies**, Manchester, Connecticut 06040; Jim or Mike Tierianni, (860) 643-4768



**Xtreme Radio Control**, New Milford, Connecticut 06776; Paul or Pete, (860) 354-4703



**R/C Madness**, Enfield, Connecticut 06082; Christopher Marcy, (860) 741-6501; email: [cmarcy@cmadness.com](mailto:cmarcy@cmadness.com); web: [www.cmadness.com](http://www.cmadness.com)



**SpeedZone Raceway**, Cromwell, Connecticut 06416; David Kahn, 860-632-9278; email: [info@speedzone-hobbies.com](mailto:info@speedzone-hobbies.com); web: [www.speedzone-hobbies.com](http://www.speedzone-hobbies.com)



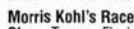
## DELAWARE

**ESRC**, Seaford, Delaware 19973; Bill Auchterlonie, 302-734-2757/302-629; email: [aeromarine@erols.com](mailto:aeromarine@erols.com)



## FLORIDA

**Hobby World Raceway**, Jacksonville, Florida 32210; Greg, (904) 772-9022



**Morris Kohl's Raceway and Hobby Shop**, Tampa, Florida 33604; Morris Kohl, (813) 931-1626



**First Coast Speedway**, Jacksonville, Florida 32211; Bobby Phillips, 904-716-0861; web: [www.firstcoast-toracing.com](http://www.firstcoast-toracing.com)



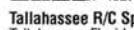
**My Rose Hobbies & Crafts**, Jupiter, Florida 33458; Mark Watson, (561) 744-3800



**Sarasota RC Speedway**, University Park, Florida 34201; Jim Wilson, (941) 358-7047



**Monza R/C Speedway**, Miami, Florida; Ed Delgado, (305) 437-9895



**Tallahassee R/C Speedway**, Tallahassee, Florida 32301; Tim Cook, 850-514-3365; email: [idothre@hot-mail.com](mailto:idothre@hot-mail.com); web: [www.tallahassee.com](http://www.tallahassee.com)



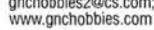
**Daytona/Strickland RC Park**, Holly Hill, Florida 32174; Mike Wichman, 386-677-0898; email: [mxnicht@aol.com](mailto:mxnicht@aol.com)



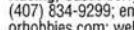
**Hobby Central**, Pensacola, Florida 32504; Bill McLester, 850-471-9800; email: [info@hobbycentralrc.com](mailto:info@hobbycentralrc.com); web: [www.hobbycentralrc.com](http://www.hobbycentralrc.com)



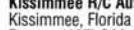
**G&C Hobby Raceway**, Lantana, Florida 33462; George, 561-547-3812; email: [gnchobbies2@cs.com](mailto:gnchobbies2@cs.com); web: [www.gnchobbies.com](http://www.gnchobbies.com)



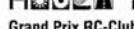
**Superior Hobby R/C Parking Lot**, Casselberry, Florida 32707, (407) 834-9299; email: [racing@superiorhobbies.com](mailto:racing@superiorhobbies.com); web: [www.superiorhobbies.com](http://www.superiorhobbies.com)



**Kissimmee R/C Auto Racing**, Kissimmee, Florida 34741; John Rosser, (407) 944-4913; email: [john@craftworldflorida.com](mailto:john@craftworldflorida.com); web: [www.craftworldflorida.com](http://www.craftworldflorida.com)



**Grand Prix RC-Club**, Ft. Pierce, Florida 34945; Luther Peterson, 772-473-2130; email: [grandprixhobbies@aol.com](mailto:grandprixhobbies@aol.com)



**SpeedZone Raceway**, Cromwell, Connecticut 06416; David Kahn, 860-632-9278; email: [info@speedzone-hobbies.com](mailto:info@speedzone-hobbies.com); web: [www.speedzone-hobbies.com](http://www.speedzone-hobbies.com)



## KEY TO SYMBOLS



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**Outdoor**



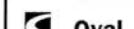
**Asphalt**



**Off-road**



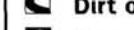
**Minis & Micros**



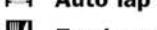
**On-road**



**AC power**



**Oval**



**Dirt oval**



**Carpet**



**Food available**

Treasure Coast R/C Club, Palm City, Florida 34990; Doug Goethel, 772-283-2260; email: 1ringo@adelphia.net



## GEORGIA

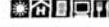
SCORE-Phil Hurd Raceway, Savannah, Georgia 31406; Pat Rossiter, Club President, 912-920-2668; email: rossspeed@msn.com; web: www.score-racing.org



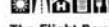
Augusta R/C Racer's Club, Augusta, Georgia 30909; Darren, 706-860-5608; web: Augusta.rc.freehomepage.com



Dalton Motorsports, Dalton, Georgia 30721; Keith Manton, 706-226-6699; email: dmso@alotet.net



Primetime Raceway, Calhoun, Georgia 30701; Tommy Jackson, 706-625-9037; email: primetimehobby@gccinternet.net; web: primetimehobby@gccinternet.net



The Flight Box Hobby Shop, Rome, Georgia 30161-6826; Leslie Duke, (706) 234-3014



Echeconne Super Speedway, Macon, Georgia 31216; Clifford Kline, 478-256-2032; email: gck1000@aol.com



Hobby Town Raceway, Columbus, Georgia 31909; Frank Bastos, (706) 660-1793; email: fbastos@mindspring.com; web: www.hobbytown.com



## HAWAII

A.S.I. Racing, Kapaa Kauai, Hawaii 96746; Arnold Morales, 808-821-8132



Radio Control Assoc./Akaa Park Raceway, Pearl City, Hawaii 96782; Ace R/C Products, (808) 456-1279



Sandy Flemings, Pearl City, Hawaii 96782; Dave Caldwell, 808-456-7272; email: info@formula1-rc.com; web: www.formula1-rc.com



## IDAHO

Almosta Ranch R.C.s, Twin Falls, Idaho 83301; Casey Clements, (208) 733-8667; email: james\_casey-clements@hotmail.com



Capital Dirtburners, Boise, Idaho 83702; Joe Thompson, 208-466-6334; email: internarchitect@yahoo.com; web: communities.msn.com/capitaldirtburners



DM Raceway, Pocatello, Idaho 83201; Mike Buffalo, 208-233-8163; email: mike@dmraceway.com; web: www.dmraceway.com

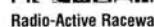


## ILLINOIS

Machesney Park Raceway, Machesney Park, Illinois 61115; Gina, (815) 282-1311; email: mpr30@aol.com; web: www.mpr30.homestead.com



Monee R/C Raceway, Monee, Illinois 60449; Roy or Roberta Moody, (708) 534-2422 (trac)



Radio-Active Raceway, Bolingbrook, Illinois 60440; Jim, (630) 759-7557; email: RCVoltar@aol.com



C.I.R.C.A., Jacksonville, Illinois 62659; Randy Tendick - Sport-N-Hobby, (217) 245-1375; web: http://home.mchsi.com/~circa



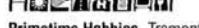
HobbyTown USA, Oak Park, Illinois 60301; Mark or Fred, (708) 445-8056; email: htuopl@aol.com



AJs Raceway & Hobby, Dekalb, Illinois 60115; AJ, 815-756-2772; web: www.ajsraceway.com



Venture Raceways, Libertyville, Illinois 60048, (847) 549-6963



Primetime Hobbies, Tremont, Illinois 61568; Don Davis, 309-925-9999; email: staff@primetimehobbies.com; web: www.primetimehobbies.com



His N Hers Hobbies Raceway, Bloomington, Illinois 61701; Kevin Turek, 309-827-0204; email: hisnhershobbies@aol.com; web: www.hisnhershobbies.com

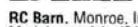


C&R Hobbies, Milford, Illinois 60953; Ray Craighead, 815-889-4073; email: thomas@milnet.net



## INDIANA

Hobby Barn Raceway, Terre Haute, Indiana 47802-9694, (812) 299-5773



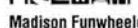
RC Barn, Monroe, Indiana 46772; Mark Lengerich, (219) 692-6600; email: bigdaddy@adamswells.com; web: www.rcbarn.com



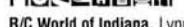
Pete Russell's R/C Speedway, Elkhart, Indiana 46516; Pete Russell, 574-293-1827



Bremen Racing Ent., Bremen, Indiana 46506; Dale Heuberger, 219-546-3807



Madison Funwheelers, Madison, Indiana 47250; Dan Rennkamp, 812-614-2572



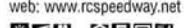
R/C World of Indiana, Lynn, Indiana 47355; Joe Kolp, (765) 874-2464; email: rcworld@rcworld.com; web: www.rcworld.com



Duneland Hobbies & Raceway, Portage, Indiana 46368; Ron, 219-763-1610; email: RTrobaugh1@email.msn.com; web: www.dunelandhobbies.com



Schoolyard RC Speedway, Lagrange, Indiana 46761; David W. Bryan, 260-435-3558; email: dwbryan@iota.net; web: www.rcspeedway.net



RCR CR Raceway, Boonville, Indiana 47601; Scott Payton, 812-477-9661; email: spdracer@speedex.net; web: www.rcrcr.com



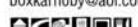
Showtime Lot Racing, Fort Wayne, Indiana 46819; Mike Romines, (219) 478-6099; web: fortwaynerpcark.tripod.com/



Hobby Haven, Des Moines, Iowa 50322; Rick Marble, (515) 276-8785; web: www.hobbyhaven.com



IROAR-Vinton Raceway @ Vinton Roller Rink, Cedar Rapids, Iowa 52402; Ed Karr, 319-362-1291; email: boxkarhobby@aol.com



Manly R/C Club, Manly, Iowa 50456; Bruce Hill, (641) 454-2025



Marble's Raceway, Des Moines, Iowa 50317; Rick Marble, (515) 262-7507



Dubuque R/C Speedway, Dubuque, Iowa 52002; Craig Schmal, 563-587-0218; email: rccraig7@aol.com; web: www.geocities.com/dbqrc



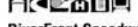
Radio Control Raceway Park, Fort Dodge, Iowa 50501; Bernie Halverson, (515) 576-3780; email: bernie@fronet.net



Wild Bill's Raceway, Knoxville, Iowa 50138; William Anderson, Jr., 641-842-5973; email: wildbillz@iowatele.com; web: www.wildbillsracing.com



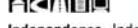
Ames Radio Control Speed Assoc., Ames, Iowa 50014; Ryan Davis/Brad Scandrett, 515-231-8153/432; email: Davismotorsp@aol.com



RiverFront Speedway, Fort Dodge, Iowa 50501; Bernie Halverson, 515-576-3780 (515-57: email: bhalver@doggenet.com



Iowa City R/C Racing Association, Iowa City, Iowa 52240; Hobby Corner, (319) 338-1788



Independence, Independence, Iowa 50644; Eugene Bachman, 319-266-3857; email: BachmanE2@hotmail.com



## KANSAS

D&B Raceway, Menlo, Kansas; Ron Ball, (785) 855-2370



## KENTUCKY

Pit Stop Hobbies, Paducah, Kentucky 42003; Robert or Rodney, 270-443-0052; email: pitstop1@apex.net



Trio Hobbies & R/C, Radcliff, Kentucky 40160; Maurice Johnson, (502) 351-7547



Dixon's R/C RaceWay, Hazard, Kentucky 41701; Jeff Dixon, (606) 436-4820; email: jefdrdr@hotmail.com



Mayking R/C Speedway, Mayking, Kentucky 41837; Jon Fields, 606-633-4700; email: jon1@se-tel.com



Coyote Raceway, Lexington, Kentucky 40505; Steve M., 859-253-9330; email: coyoterace1@hotmail.com; web: www.coyoteraceway.com



Wildcat Speedway, Nicholasville, Kentucky; David Bowles, 859-272-0231



R.C.WOW, Falmouth, Kentucky 41040; John P. Jones, (859) 654-1700; email: rcwow@fuse.net; web: www.rcwow.com

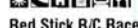


## LOUISIANA

St. Charles RC Speedway, Destrehan, Louisiana 70047; Al Cazalot, (504) 764-0625; email: stcharlesracer@home.com; web: members.home.net/stcharlesracer



Gator R/C Raceway, Moss Bluff, Louisiana 70612; Tony Diaz, 337-855-3206; email: keithsjac@aol.com; web: homepage.mac.com/kmaples/



Red Stick R/C Raceway, Baton Rouge, Louisiana 70814; Michael Pino, 225-218-1002; email: redstickracing@aol.com; web: www.redstickracingway.com



Manly R/C Club, Manly, Iowa 50456; Bruce Hill, (641) 454-2025



Marble's Raceway, Des Moines, Iowa 50317; Rick Marble, (515) 262-7507



Hwy. 44 Hobby Shop, Gonzales, Louisiana 70737; Eric Olmstead, (225) 644-1773; email: eric209@aol.com



Fast Pace Hobbies, Alexandria, Louisiana 71301; Joseph or Casey Toralba, 318-561-2070; email: fastpacehobbies@aol.com



## MAINE

Clay Bowl R/C Hobbies, Greene, Maine 04236; Pat Cap, (207) 946-5003

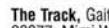


Central Maine R/C Speedway & Hobbies, Fairfield, Maine 04963; David Prescott, (207) 453-4588; email: rcracer@mint.net



## MARYLAND

GPA Hobbies, Crofton, Maryland 21114, 301-858-0004



The Track, Gaithersburg, Maryland 20877; Mimi Wong, (301) 417-9630; email: minithettrack@yahoo.com; web: www.rctrack.com



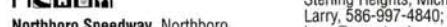
HobbyTown USA, Glen Burnie, Maryland 21061; David Parkison, 410-590-4950; email: racing@mdhobbytown.com; web: www.mdhobbytown.com



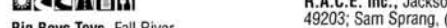
Coles Race Way, Waldorf, Maryland 20602; Cole Brinfield, (301)-843-1386; email: kbrinfield@cs.com



KT Superspeedway, Battle Creek, Michigan 49015; Jerry or Sam, 616-965-0116



Larry's Performance RC Carpet Track, Sterling Heights, Michigan 48314; Larry, 566-997-4840; email: lprcs@qwest.net



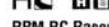
R.A.C.E. Inc., Jackson, Michigan 49203; Sam Sprang, (517) 787-9161



Megadrome Raceway, North Adams, Massachusetts 01247; Bob Blanchette, 413-743-7223



Northboro Speedway, Northboro, Massachusetts 01532; Bob Trimble, 508-393-8087 or 393-



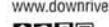
Big Boys Toys, Fall River, Massachusetts 02723; Track Owner, 508-677-9400



Hi-Tech Hobbies, Raynham, Massachusetts; Ruben, (508) 880-5373



R/C Excitement, Inc., Worcester, Massachusetts 01606; Todd Anderson, 508-853-3272; email: rcexcitement@aol.com; web: www.rcexcitement.com



RPM RC Raceway, Abington, Massachusetts 02351; Richard Tonetti, 781-857-1177; email: rpmrc@comcast.net



East Templeton Model Raceway, Templeton, Massachusetts 01468; Keith Anderson, 1-978-632-1619; email: keith@glowplug.com; web: glowplug.com



D.R. R/C, Taylor, Michigan 48180; Bobby or Fred, (734) 287-7405; web: www.downriverracing.com



R&L Hobbies & Racing, Portage, Michigan 49002; Rex Simpson, (616) 323-3686; web: www.rlhabbies.com



Village R/C Raceway, Decatur, Michigan 49045; Chuck Nolke, (616) 423-7878



N.M.R.C.C. Speedway, Gaylord, Michigan 49735; Gabe, (989) 732-3963; email: hobby-toy@voyager.net



Raw Roots Race Tracks, West Olive, Michigan 49460; Roy Benink, (616) 399-9338; email: rrtb@tm.net



Small Cars Unlimited, Jackson, Mississippi 39212; Ed Hill, 601-372-3278; email: fast@smallcarsunlimited.com; web: www.smallcarsunlimited.com



Meridian RC Speedway, Meridian, Mississippi 39302; Joe or Pearce, 601-483-7000



Small Cars Unlimited, Jackson, Mississippi 39212; Ed Hill, 601-372-3278; email: fast@smallcarsunlimited.com; web: www.smallcarsunlimited.com



Village Hobbies, Hesperia, Michigan 49421; John Fosdick, 231-854-1374; email: vhrcing@triton.net



Dirt Burner Racing, Commerce, Michigan 48390; Bill, 248-926-1140; web: www.dirtburnerracing.com



Lazer RC Speedway, Adrian, Michigan 49221; Russ Johnson, (517) 263-2806



Fastrax, Brownstown, Michigan 48173; Greg Yingling, (734) 379-8980; email: fast3@hotmail.com



Jons Hobby, Mt. Pleasant, Michigan 48858; Jon Beutler, (517) 773-5412; email: jonsobby@earthlink.net; web: www.jonshobby.com



E.U.P., Kincheloe, Michigan 49788; Joel Wiggins, 906-495-3503



Great Lakes Racers Club, Grand Rapids, Michigan 49858; John Warner, 616-838-2231; email: Gr8LksRacers@comcast.net; web: www.rogers3.com/glc/



Hideaway Raceway, Napoleon, Michigan 49201; David Carlisle, 1-517-536-8821; email: adcarlisle1@netscape.net



JT Superspeedway, Battle Creek, Michigan 49015; Jerry or Sam, 616-965-0116



Larry's Performance RC Carpet Track, Sterling Heights, Michigan 48314; Larry, 566-997-4840; email: lprcs@qwest.net



Northwoods Hobby Raceway, Brainerd, Minnesota 56401; John or Doug, (218) 829-9257



Kevin's Off-Road Raceway, Crookston, Minnesota 56176-2317; Kevin Altepeter, (218) 281-7523; email: kevin@krcproducts.com; web: www.krcproducts.com



Twin Cities Hobby & Raceway, Brooklyn Park, Minnesota 55428; Mark O'Brien/Ray Cook, (763) 315-8700; email: woodduster@msn.com; web: www.twincityhobby.com



National Speedway, Fridley, Minnesota 55432; Steve Hedenland, 763-571-9283; email: mrtip@nationalhobby.com; web: www.nationalhobby.com



Country R/C Raceway Park, Belvidere, Minnesota 56214-8115; Charles L. Steffl, 507-641-8115



MISSISSIPPI

X-Treme RC, Saucier, Mississippi 39574; Marty Capers, (228) 539-2004



Meridian RC Speedway, Meridian, Mississippi 39302; Joe or Pearce, 601-483-7000

## MISSOURI

### RCTRAX Racing Club of Central

Missouri, Hallsville, Missouri 65255; Gary Philippe, 573-442-8183; email: philip74@verizon.net



Ozarks R/C Raceway, Springfield, Missouri 65803; Gene Rhodes, 417-873-9350 (Track); email: OzarksRaceway@aol.com



Real Blue Vue R/C, Kansas City, Missouri 64133; Steve Hale, (816) 358-0238; email: hrealrc@aol.com; web: www.geocities.com/real\_rc\_raceway



Real R/C Raceway, Pleasant Hill, Missouri 64080; Steve Hale, (816) 540-5584; email: hrealrc@aol.com; web: www.real-rc.com



Novelty R/C Raceway & Hobbies, Novelty, Missouri 63460; Rex & Jena Franke, 660-739-4530; email: rex\_jena@noveltyrc.com; web: www.noveltyrc.com



Showtime Speedway, Bakersfield, Missouri; Don Risner, (601) 203-1481



Hobbies In Motion Raceway, Springfield, Missouri 65803; Matthew Froning, 417-886-9621; email: mrkid-turismo@aol.com; web: www.gor-c.com



North Missouri Raceway, Chillicothe, Missouri 64601; Billy Johnston, (660) 646-1120



Fastlane Raceway & Hobbies, Blue Springs, Missouri 64015; Shane & Randy, (816) 220-0100; email: info@fastlanehobby.com; web: www.fastlanehobby.com



B&L Hobbies & Raceway, Park Hills, Missouri 63061; Bob Marler, (573) 431-9444; web: www.bandlhobbies.com



## MONTANA

Magic City Racers, Billings, Montana 59102; Bryan Grummets, 406-656-8266; email: jsavies@tgrsolution.net; web: www.magiccityrc.com



RC Offroad Association of Racing (ROAR), Libby, Montana 59923; Jamie, 406-293-6506; email: sharkboyet@hotmail.com



Garden City R/C Speedway, Missoula, Montana 59801; Brian Culp, (406) 549-7992; email: gardencityrc@msn.com



## NEBRASKA

O.N.R.O.A.D., Omaha, Nebraska 68104; CoRK Jacobs, (402) 556-8674



OTWG Carpet Raceway, Norfolk, Nebraska 68701; John Schoenauer, (402) 644-7922



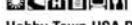
The Salvation Army Speedway, Omaha, Nebraska 68164, 402-734-3414



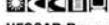
Hobby Town Raceway, Lincoln, Nebraska 68505; Chris or Chad, 402-434-5056; email: eaststore@aol.com



Hadar R/C Raceway, Norfolk, Nebraska 68701; John Schoenauer, (402) 644-7922



Hobby Town USA Raceway Park, Lincoln, Nebraska 68508; Chad or Chris, 402-434-5056; email: east-store@aol.com



NESCAR Raceway, Grand Island, Nebraska 68801; Steve Blayne, (308) 385-5468; email: spinkgi@nebi.com



## NEVADA

T-Rix bikes & R-C shop, Elko, Nevada 89801; Gary Perkins, (775) 777-8840; email: mtnman14k@hotmail.com



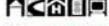
Las Vegas R/C Raceway, Las Vegas, Nevada 89139; Patrick Quinn, 702-365-1396; email: patrickquinn98@lvc.com; web: www.lasvegasrcraceway.com



1stplacerace.com Raceway, Fallon, Nevada 89406; Stan Lattin, 775-867-3357; email: info@1stplacerace.com



Dansey's Indoor R/C & Hobbies, Las Vegas, Nevada; David Lugo, (702) 453-RACE or (8; web: www.danseys.com



## NEW HAMPSHIRE

RT 106 Racepark, Pembroke, New Hampshire 03275; David Daniels, 603-224-7223; email: david@collectracing.com; web: www.106racepark.com



Lakes Region R/C Speedway, Gilford, New Hampshire 03246; Louie Blais, 603-524-2909; email: racing@lakesregionrc.com; web: www.lakesregionrc.com



Hill Top R/C, Troy, New Hampshire 03465; Pete Bastoni/Jim MacPherson, 603-242-3222; email: hilltoprc@net�ders.com; web: www.hilltoprc.com



## NEW JERSEY

Jefferson Speedway, Oak Ridge, New Jersey 07438; Jim, (973) 697-7525



Millville R/C Oval & Roadcourse, Millville, New Jersey 08332; William Denstoz, 856-327-4640



On Trax Hobbies, Browns Mills, New Jersey 08015; Joseph DiGirolamo, (609) 735-0422



The Race Place, Farmingdale, New Jersey 07731; John Fary, (908) 938-5215



Wacky RC Raceway, Roselle, New Jersey 07203; Tony Williams or Kimble Wright, (908) 241-6700



Back Track Raceway, Hammonton, New Jersey 08037; Bob W., 609-214-5016



Family Hobbies Raceway, Vineland, New Jersey 08360; Linda Vogel, 656-696-5790; email: familyhobbies@yahoo.com; web: familyhobbiesraceway.com



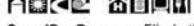
Jackson RC Club, Jackson, New Jersey 08527; Al Sardano, 908-770-7621; email: njeyeguy@optonline.net; web: www.jacksonrcracing.com



South Jersey Cost Controlled Racing, Sicklerville, New Jersey 08081; Ray Murray, 856-629-9413; email: RaysTrack@webtv.net; web: www.sjccr.com



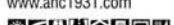
PottBellys R/C Speedway, PittsGrove, New Jersey 08360; Drew Anastasio, 856-207-2495; email: pottbelly@pottbellysrc.com; web: www.pottbellysrc.com



SpeedPro Dragway, Elizabeth, New Jersey 07206; Albie Nizolek, 908-351-5080; email: funnycar176@aol.com; web: www.speedpro.org



America's Hobby Center Inc., North Bergen, New Jersey 07047; John Many, (201) 662-0777; web: www.ahc1931.com



Checkerboard Raceways, Elwood, New Jersey 08217; Ray Murray, 856-629-9413; email: RaysTrack@webtv.net



## NEW MEXICO

Albuquerque R/C Off-Road Raceway, Albuquerque, New Mexico 87120; Bill Mitchell, (505) 250-3411(m); (e: email: info@rcDirtTrack.com; web: www.rcDirtTrack.com



Speed Zone, Clovis, New Mexico 88101; Brad Ferguson, 505-769-1737; email: speedzone@yuucca.net



## NEW YORK

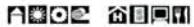
Brennan's RC Hobbies, Vernon, New York; Bill or Tom Brennan, (315) 829-4930



Southern Tier Raceway, Owego, New York 14827; Anita Harding, (607) 687-5395



South Shore Hobby & Raceway, Coram, New York 11727; Benny or Bonnie, 631-696-8500; email: southshorehobby@lilonly.com



Walt's Hobby, Syracuse, New York 13209; Bruce, 315-453-2291; web: www.walts-hobby.com



Long Island Raceway, Farmingdale, New York 11735; James, (516) 845-7223; web: www.raceway.com



PRO Speedway, Cattaraugus, New York 14719; Marc Pritchard, (716) 257-3101



Fastraks, Hogansburg, New York 13655; Mark Castonguay, (518) 358-3686; email: froghobb@northnet.org; web: www.fastraks.8m.com



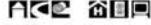
batham R/C Raceway, Bear Creek, North Carolina 27207; Dwight Fields, (919) 898-4518; email: crrcr@wave-net.net



Southern R/C Motorsports Club, Shallotte, North Carolina 28459; Chris Dixon, (910) 754-6315; email: nohope@atmc.net



Race City Motor Speedway, Mooresville, North Carolina 28115; Ray Kelly, 704-660-FAST; email: Kellyrcms@cs.com; web: racecitymotorspeedway.com



Xtreme Hobbies, Kannapolis, North Carolina 28083; Chris Leyer, 704/933-5321; email: thehob@byshop02@aol.com



## OHIO

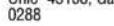
American Ohio Sprint Car, Wickliffe, Ohio 44092; Gary Waldhelm, 440-944-9966; web: www.aosca.8m.com



CORCAR / STAR CINEMA, Grove City, Ohio 43123; Bill Stevenson, (614) 870-7159



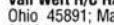
D&J R/C Raceway, Orrville, Ohio 44667; Don, (330) 682-4266



Nothing But Air R.C. Track, Logan, Ohio 43138; Gary Lloyd, 740-385-0288



TARCAR, Toledo, Ohio 43617; Bill Bridges, (419) 826-3859



Van Wert R/C Raceway, Van Wert, Ohio 45891; Mark Davis, (419) 232-2112



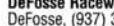
Outlaw Speedway, Lexington, Ohio; Eric Radio, 419-884-0001; email: kramerj@comcast.net; web: rcdirtoval.freerversers.com



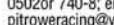
Ultra Racing R/C Hobby and Track, Hamilton, Ohio 45015; Ed Lewis, 513-863-7342; email: UltraRacing@aol.com; web: www.rccaronline.com



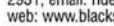
T.S.R.C.A.R., Hamilton, Ohio 45011; Dennis Young, (513) 367-5634; email: scalercr@ao.com; web: www.tristarcautroracers.com



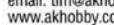
DeFosse Raceway, Ripley, Ohio; Greg DeFosse, (937) 377-2063



Hobbyland Raceway, Proctorville, Ohio 45669; Craig Harber, 740-886-0502 or 740-8; email: pitroweracing@webtv.net; web: hobbylandraceway.homenet.com



Black Swamp RC Car Club, Toledo, Ohio 43623; Riders Hobbies, 419-843-2931; email: ridersrcclub@webtv.net; web: www.blackswamprc.com



AK Hobby & Raceway, Cincinnati, Ohio 45211; Tim Tolle, (513) 661-7080; email: tim@akhobby.com; web: www.akhobby.com



Mid Ohio Dirt Oval, Lexington, Ohio 44904; D&D Hobby Center, (419) 884-0001



Ohio Valley OffRoad R/C Raceway, Jerusalem, Ohio 43747; Kevin Wilson, (740) 926-1738; email: consol@1st.net; web: www.ovor.8m.com



## KEY TO SYMBOLS



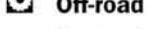
Indoor



Outdoor



Off-road



On-road



Oval



Dirt oval



Carpet



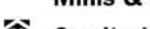
Concrete



Asphalt



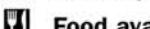
Minis & Micros



On-site hobby shop



AC power



Auto lap counting



Food available

R/C Hobby, Medina, Ohio 44256;  
Larry Lutz, 330-723-0255; email:  
kohouty@aol.com



River Rat Racing, Ripley, Ohio 45167;  
Jon Faris, 937-392-9298; email:  
honey3@bright.net; web: www.riverratracing.com (under construction)



Y-City Hobby & Speedway, Zanesville,  
Ohio 43701; Kevin McKenna,  
(740)455-3025; email: Kevin@ycity-  
hobby.com; web: www.ycityhobby.com



RaCewy 42, Mansfield, Ohio 44905;  
Chris Cates, 419-589-4173; email:  
mopar30v8@aol.com; web:  
www.RaCewy42.ltgo.com



## OKLAHOMA

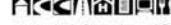
Adams Creek R/C Speedway, Broken  
Arrow, Oklahoma 74014; John  
Beigle, (918) 355-1416



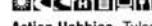
Competition R/C, Oklahoma City,  
Oklahoma 73149; James or Louise  
Brown, (405) 634-0809; email:  
comp1@aol.com



Enid R/C Speedway, Enid, Oklahoma  
73703; Darin Pendleton, (580) 554-  
9400; email: darin@enid.com; web:  
www.enidrcracing.com



Action RC Speedway, Oklahoma City,  
Oklahoma 73135; Jerry Hawthorne,  
(405) 670-7770; email:  
ginna@flash.net; web:  
www.actionrc.com



Action Hobbies, Tulsa, Oklahoma  
74145; David Cole, (918)663-8998;  
email: aucthob@aol.com



HobbyTown USA, Norman, Oklahoma  
73072; Todd Jenson, (405) 292-5850



Wings N Things Raceway, Tulsa,  
Oklahoma 74105; Heath Anderson,  
(918) 745-0007



## OREGON

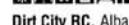
R/C Plus Hobbies Raceway, Salem,  
Oregon 97302; Ron Smith, (503) 364-  
9188; email: rplus@rcplus.com; web:  
www.rcplus.com



Competition Racing Association,  
Portland, Oregon 97230; Mark Taylor,  
Pres., 503-761-1334; 503-761-  
email: mark@cra-news.com; web:  
cra-news.com



Rose City Scale Racing, Milwaukee,  
Oregon 97222; Rick Strauss, (503)  
631-2929; web: www.rc-cars.com

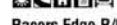


Dirt City RC, Albany, Oregon 97321;  
Doug Vertrees, (541) 791-1089; email:  
quickemporro@aol.com



## PENNSYLVANIA

McCullough's Offroad, Sarver,  
Pennsylvania 16055; Doug  
McCullough, (724) 352-0116; email:  
dmccull323@aol.com; web:  
www.mcculloughsoftroad.com



Racers Edge R/C Racing & Hobbies,  
Smethport, Pennsylvania 16749; Rick  
Morgan or John Simar, (814) 887-  
9256; email: postmaster@rac-  
ersedge.com



Newville RC Speedway & Hobbies,  
Newville, Pennsylvania 17241; Randy  
or Mike, 717-776-5568; email:  
newvillercspeedway@yahoo.com; web:  
www.newvillercspeedway.com



RB Motorsports & Hobby,  
Northumberland, Pennsylvania 17857;  
Rick Bunting, (570) 473-8711



WillCam Raceway, Punxsutawney,  
Pennsylvania 15767; James Campbell,  
(814) 939-4251



DC Ultra Trax, Warminster,  
Pennsylvania 18974; David Cowan,  
(215) 672-5200; web: www.jcrchob-  
bies.com



TRP, Kingston, Pennsylvania 18704;  
Rob Yeager, 570-283-3066; email:  
rcro99@aol.com



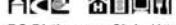
Little Plum R/C Hobbies, Lock Haven,  
Pennsylvania 17745; Larry Duck,  
(570) 769-1984



Marshall's R/C Raceway, Honesdale,  
Pennsylvania 18431; Bill or Dot  
Marshall, (570) 729-7458



The Raceway at River Junction,  
Beaver, Pennsylvania 15009; Sam or  
John, (724) 728-5571; email:  
river-jct@stargate.net



RC Dirlburners Club, Windber,  
Pennsylvania 15963; Bruce Schmidt,  
(814) 266-4118; email:  
rckidd1@cs.com



Thunder Road Raceway, Limerick,  
Pennsylvania 19468; Barry or John,  
610.831.8898; email:  
xslotgodx@aol.com; web:  
www.tow-br.com



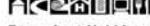
J&K Hobbies and Raceway, Jersey  
Shore, Pennsylvania 17740; Jason  
Corte or Kevin Casbeer, 570-398-  
8171; email: rcmaniac01@msn.com



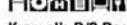
Bumps & Jumps RC Speedway, Etters,  
Pennsylvania 17319; Chris McKinney,  
717-728-4613; email: bumpsandjumps-  
src@comcast.net



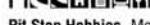
Washington RC Raceway,  
Washington, Pennsylvania 15301;  
Aaron Stimmell Jr., 724-228-8396



Dreamboat Hobbies, Warren,  
Pennsylvania 16365; Louise Dussia,  
(814) 723-8052; email: dream-  
boat7@yahoo.com



Kranzel's R/C Raceway & Hobbies,  
Lemoyne, Pennsylvania 17043; David  
or Stuart Kranzel, (717) 737-7223;  
web: www.kranzelsrhcobbies.com



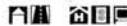
Pit Stop Hobbies, Mount Joy,  
Pennsylvania 17552, (717) 653-6222;  
email: pitstophobbies@pitstophob-  
bies.net; web: www.pitstophobbies.net



RC Avenue II, Bradenville,  
Pennsylvania 15650; Chris Demyan,  
724-537-9592; email: 12ss@msn.com



RC Outfitters, Hanover, Pennsylvania  
17331; Chris Shaffer, (717) 633-9490;  
email: thestore@rcobbies.com; web:  
www.rcobbies.com



Riverside Raceway, Warren,  
Pennsylvania 16365; Jeff, (814) 723-  
4211



Staub Bros. R/C Speedway,  
Gettysburg, Pennsylvania 17325; Todd  
or Scott Staub, 717-334-8488; web:  
www.staubbrothers.com

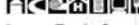


Trains & Lanes Raceway, Easton,  
Pennsylvania 18045; Jeff Setzer, (610)  
253-8850 or (8); email:  
trainslanes@aol.com



## RHODE ISLAND

SK Hobbies Inc., Johnston, Rhode  
Island 02919; Slim or Keith, (401)  
453-1440



Insane Track, Cranston, Rhode Island  
02907; Jose Jimenez, 401-467-8878;  
email: chevgy08@aol.com; web:  
www.insanehobbies.homestead.com



## SOUTH CAROLINA

Atomic Racers, Aiken, South Carolina  
29803; Bill Jackson, 706-855-0846 or  
803-



Carolina R/C Speedway, Easley, South  
Carolina 29640; David, 864-295-1209;  
email: cprahlc@midnspring.com; web:  
www.carolnarc.com



Darlington R/C Raceway at Hobbies &  
More, Darlington, South Carolina  
29532; Jerry Pollard, (843) 393-0355;  
web: www.hobbiesnmore.com



D&S Hobbies R/C Track, Hartsville,  
South Carolina 29550; Don Dietz, 843-  
383-0017; email:  
dshobbydon@aol.com; web:  
www.dshobbies.com



Hi Voltage Raceway, Anderson, South  
Carolina 29625; Whittner Bowen, 1-  
864-225-8680; email:  
Janilon247@aol.com



The Grove Racing Center, Rockhill,  
South Carolina 29730; Don Faris,  
(803) 327-4121; web: www.hob-  
bystop.com



## SOUTH DAKOTA

Triple B, Winner, South Dakota 57580;  
Brock Stout, (605) 842-2699



Grassland Racers, Black Hawk, South  
Dakota 57718; Ryan Logan, (605)  
787-5632



Dakota Off-Road Racers, Aberdeen,  
South Dakota 57401; Kevin, 605-225-  
5223



## TENNESSEE

Need For Speed Raceway R/C,  
Chattanooga, Tennessee 37415;  
Ronnie Cox, (423) 876-9019



W.O.W. Raceway, Beech Bluff,  
Tennessee 38313; Brad Jones, 731-  
427-1625; email:  
wovracer@hotmail.com; web:  
go.to/wowracing



Robertson's R/C Raceway, Jackson,  
Tennessee 38301; Travis Robertson,  
731-423-6984; email:  
RobertsonRC@aol.com



SpeedZone Raceway & R/C Hobbies,  
Sweetwater, Tennessee 37874; Mike  
Henderson, 423-351-0055; email:  
speedzonr@msn.com; web:  
www.speedzonraceway.com



Statenine Village Raceway, Ducktown,  
Tennessee 37326; Len James, 423-  
496-5006; email: statelin@ellijay.com



Mid-South Racing Association,  
Memphis, Tennessee 38133; Michael  
Feliciano, 901-268-7969; email:  
michael.feliciano@expeditors.com;  
web: www.msra-racing.com



Hobby Town USA, Franklin, Tennessee  
37067; Bobby Mills, (615) 771-7441;  
email: htu126@aol.com



MSA R/C Racing, Crossville,  
Tennessee 38555; D.R. Findley, (931)  
456-0027



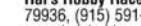
B&B R/C Hobbies, Big Spring, Texas  
79722; Walter Bumbulis, (915) 263-  
1790; email:  
b&brchobbies@apex2000.net



Austex RC, Austin, Texas 78757;  
Michael, 512-458-2324; web:  
www.austexrc.com



Drycreek Raceway, Greenville, Texas  
75402; Micky Alphin, 903-527-5381;  
web: web.pulse.net/drycreek



Hal's Hobby Raceway, El Paso, Texas  
79936, (915) 591-2213; web:  
www.halshobbywarehouse.com



Hobbytown USA, San Antonio, Texas  
78209; Clark, (210) 829-8697; fax



Mike's Hobby Shop Superstore &  
Raceway, Carrollton, Texas 75006,  
972-242-4930; web: www.mikesho-  
byshop.com



Reflex R/C, Houston, Texas 77055;  
Joseph Chen, (713) 464-4458; web:  
www.reflexrc.com



Indy R/C World, Garland, Texas  
75041; Steve Webster, (972) 271-  
4844; fax; web: www.indycworld.net



Big Mike's R/C Raceway, Longview,  
Texas 75604; Mike Sumrow, 903-297-  
7814



T&M Raceway R/C Drag Racing,  
Addison, Texas 75244; Marvin  
Jackson, (972) 416-0445; email:  
mjackson@tmracingway.com; web:  
www.tmracingway.com



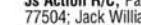
The Rollcage, Greenville, Texas  
75402; Guy Allen, (903) 883-0332;  
email: rollcage2000@therollcage.com;  
web: www.therollcage.com



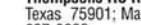
K&M Racing, New Caney, Texas  
77357; Brent Mahaffy, (281) 399-9777



Hobby Center Race Track, Houston,  
Texas 77598; Issac Ben-Ezra, 281-  
488-8697; email: Hobbycenter@issac-  
smodels.com; web: www.hobbycen-  
ter.cc



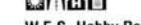
MBRC, Dallas, Texas 75093; Mike  
Battie; email: info@mbrc-racing.com;  
web: www.mbrc-racing.com



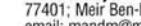
Js Action R/C, Pasadena, Texas  
77504; Jack Williams, 713-946-8888;  
email: jactionrc.net; web: www.jsac-  
tionrc.com



Thompson RC Raceway, Lufkin,  
Texas 75901; Mark Thompson, (936)  
637-0093



T&T R/C Cars, Plano, Texas 75024;  
Joe Sullivan, (972) 633-2470



X-Treme Hobbies, Round Rock, Texas  
78664; Jef Santos, (512) 310-0444 or  
(5)



W.E.S. Hobby Race, Beaumont, Texas  
77701; Marty Walker, (409) 839-4929



M&M Hobby Center, Bellaire, Texas  
77401; Meir Ben-Ezra, 713-661-7137;  
email: mandm@mmhobby.com; web:  
www.mmhobby.com



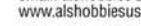
Roanoke R/C Club, Salem, Virginia  
24153; Chad Trent, 540-314-6257;  
email: roanokerc@doyleprinting.com;  
web: roanokerc.cjb.net



Finishline Raceway, Hurst, Texas  
76053; Damon Darnall, (972) 404-  
0463; email: Finishline@ev1.net;  
web: http://users.ev1.net/~finishline/ind-  
ex.htm



Al's Hobbies, San Antonio, Texas  
78227; Alfonso Robles, 210-645-1050;  
email: alshobbies@usa.com; web:  
www.alshobbiesusa.com



2nd Speedway, Abilene, Texas 79602;  
Clyde Gardner, (915) 673-2351



## UTAH

Hobbie Stop Raceway, Riverdale,  
Utah; Todd Hamilton or Beazer Martin,  
(801) 622-0841



Intermountain R/C Raceway, Magna,  
Utah 84044; David Mott, 801-250-  
8303; email: rcmother1@aol.com; web:  
members.aol.com/rcmoter1



## VERMONT

R/C Toy Box Hobbies & Tracks LLC,  
Saint Johnsbury, Vermont 05819;  
Raymond Richard, 802-748-1030;  
email: rctoybox@comcast.net; web:  
www.rctoybox.com



Empire Hobbies Off-Road Raceway,  
Saint Albans, Vermont 05478; Scott or  
Jen, 877-446-2243; email: empirehob-  
bies@surfglobal.net; web:  
www.empire-hobbies.com



## VIRGINIA

DRCW Raceway, Virginia Beach,  
Virginia 23454; Les Modlin, 757-340-  
6681; web: www.debbiesrcworld.com



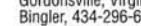
KC's Radio Control & Repair,  
Lynchburg, Virginia 24503; Curtis or  
Kim Wright, (804) 384-8596



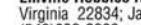
Hampton Roads R/C Drag Club,  
Virginia Beach, Virginia 23452; Gary  
Nelson, 757-399-8645; email:  
Garry@gsdracing.com; web:  
www.HRRCDC.com



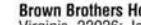
Thunder Road RC Speedway,  
Gordonsville, Virginia 22947; Robert  
Bingler, 434-296-6549; email:  
tripod@thunderroadrc.com; web:  
www.thunderroadrc.com



Linville Hobbies Raceway, Linville,  
Virginia 22834; Jason or Jerry Shenk,  
(540)833-2222; email: linvillehob-  
bies@juno.com; web: www.linvillehob-  
bies.com



Brown Brothers Hobbies, Dumfries,  
Virginia 22026; Joe or Bob Brown,  
703-221-5746; email:  
joe@bbhobbies.com; web:  
www.bbhobbies.com



**Brad's Hobbies**, Staunton, Virginia 24401; Brad, (540) 885-3642; email: brad@bradshobbies.com; web: www.bradshobbies.com



**Old Towne Hobby Shoppe**, Manassas, Virginia 20110; Jeff Gough, (703) 369-1197; web: www.oldtowne-hobby.com



**The Tilt yard**, Dayton, Virginia 22821; Homer, 540-828-3476; email: homer@tiltyard.com; web: www.tilt-yard.com



**Tidewater R/C Speedway, Inc.**, Hampton, Virginia 23663; Jim Pike, Rob Marsette, Dave Pritchard, (757) 723-8927; email: zeey31@hotmail.com



**Shamrock Raceway**, Winchester, Virginia 22601; Charlie Greathouse, 540-678-8878; web: www.shamrock.homestead.com/front-page.html



## WASHINGTON

**Race City**, Auburn, Washington 98002; Bruce, (253) 939-2515; email: auburn@pacifier.com



**Tacoma R/C Raceway**, Tacoma, Washington 98406; Scott Brown, (253) 565-1935; web: www.tacoma-raceway.com



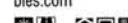
**HobbyTown USA**, Tacoma, Washington 98408; HobbyTown USA Shop, (253) 474-7787



**Hank Perry Raceway**, Spokane, Washington 99023; Hal Hudson, 509-879-3503; email: halhudson@msn.com



**Redmond Hobbies Raceway**, Redmond, Washington 98025; Stan Ng, (425) 885-3639; email: info@redmondhobbies.com; web: redmondhobbies.com



**Schmidt's Auto Parts**, Marysville, Washington 98271; Jon Failla, (360) 653-8838; web: www.schmidtscraceway.com



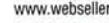
**Rain City RC Raceway**, Lynnwood, Washington 98036; Pete or Debbie Cartwright, 425-776-8241; email: info@raincityraceway.com; web: www.raincityraceway.com



**Fantasy World Raceway**, Tacoma, Washington 98408; Dave Kleinman, (253) 473-6223; email: sales@fantasy-worldhobbies.com; web: www.fantasy-worldhobbies.com



**Paradise Raceway and Hobbies**, Spokane, Washington 99207; Mark, 509-483-1843; email: paradise@hot-mail.com; web: www.websters.com/paradise



**HobbyTown USA**, Lynnwood, Washington 98037; Rich or Jamie, 425-774-0819; email: rhobbytown@aol.com



**A-Main Raceway**, Vancouver, Washington 98685; Monty Coleman, (360) 571-8404; web: www.amainraceway.com



**Burien Toyota R/C**, Seattle, Washington 98148; Ray Meek, (800) 654-6456



**Cedardale Raceway**, Mount Vernon, Washington 98273; Craig, 360-755-9464



**Four Season R/C Racing**, Olympia, Washington 98506; Gary and Sharon Brown, (360) 491-2430



**Spokane Indoor Raceway**, Spokane, Washington 99212; Brian Batch, 509-487-2122



**West Coast Hobby & Raceway**, Richland, Washington 99352; Darren Shank, (509) 375-4995



## WEST VIRGINIA

**Quiet Dell Raceway**, Fairmont, West Virginia 26554; Darris, (304) 366-1441; email: Tateracing@aol.com



**Fulton's R/C Raceway**, Wheeling, West Virginia 26003; James Fulton, (304) 233-5355



**Burr Fab R.C. Raceway**, West Union, West Virginia 26456; Mark Travis, 304-873-2487; email: burrshouse1@cs.com



**Mountwood Raceway**, Vienna, West Virginia 26105; Tom Allen, 304-295-3234; email: ray@ovrccc.com; web: www.ovrccc.com



## WISCONSIN

**The Shorthall Raceway**, Eau Claire, Wisconsin 54701; Scott Schoettle, 715-838-8350; email: Scottschoettle@mcoleusda.net



**Gary's Hobby Center**, Racine, Wisconsin 53403; Bill Phalen, 262-554-8884



**Pro-Star Racing**, Green Bay, Wisconsin 54301; Chuck or Randy, Chuck-920-494-1233/R; web: www.prostartracing.com



**S&N's Trackside Hobbies and Raceway**, Milwaukee, Wisconsin 53005; Scott Ernst, 262-783-4699; email: sernst@trackside.com; web: www.trackside.com



**KDM Raceway**, Abbotsford, Wisconsin 54405; Kevin Michig, 715-223-4414; email: kdmhobby@charter.net; web: kdmhobby.homestead.com/kdmhobby.html



**MARCCA Raceways**, Poynette, Wisconsin 53955; Don Hartley, 608-243-1778; email: hotrodharter@aol.com; web: www.marcca.com



**Mid-West Tri-Clone/Tri-Clone OffRoad**, West Bend, Wisconsin 53095; Dave Hilpert, 262-334-0429 or 262-334-0429; email: mwtc@inet.com; web: www.triclonerace.com



**ABC R/C Inc & Raceway**, Waukesha, Wisconsin 53186; Dick Mathiesen, 262-542-1245; email: Help@abcrchobby.com; web: www.abcrchobby.com



## WYOMING

**Xtreme Hobbies Raceway**, Gillette, Wyoming 82718; Krieg Balls, 307-682-6077; email: xtreme@vcn.com



## ARGENTINA

**Club A. Velez Sarsfield**, Buenos Aires; Jorge Herrero, 54-01-658-5851



**Circuit M.R. Models**, Buenos Aires 1428; Maximiliano Robalos, 54 4557 1000, fax; email: info@kyoshargentina.com.ar; web: www.kyoshargentina.com.ar



**Circuito R/C Lobos**, Lobos 7240; Rupert Bruce, 54-0227-422905; email: rclobos@yahoo.com; web: www.rclobos.8m.com



## AUSTRALIA

**R.C. Speedway**, Newcastle 2300; Andrew Dillon-Smith, 02-49265966



**Carine R/C Model Car Club, Inc.**, Greenwood; Mitchell Davies, 0418 955 981; email: t3davies@iinet.net.au



**A.C.T. Model Car Racing Club**, Wannanassa; Gary Davey, 61-6-28714111



**Aubry R/C Car Club**, Aubry 2640; Ron Langman, 060-247-128



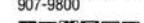
**Canberra Off-Road Model Car Club**, Narrabundah 2604; Graham Brown, 61-6-241-3070



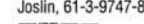
**Central Coast ORCC**, Bateau Bay 2261; Peter J. Knight, 61-43-693-698



**Illawarra RCECC**, Albion Park Rail 2527; Mel or Andrew, 042-714-683



**Lakeside R/C Racing Car Club**, Lansvale 2166; R. Bartolozzi, 62-2-907-9800



**Melton Electric Circuit Car Association**, Melton 3337; Arthur Joslin, 61-3-9747-8805



**Penfield Park**, Adelaide 5108; Trevor Unew South Walesorth, (618) 8289-5010



**Wodonga R/C Club**, Wodonga 3690; Paul Townsend, 02-6056-0706; email: townsend175@ozemail.com.au



**A.C.T. Remote Control Car Club**, Kambah; Rob Jorgensen, 61-2-6231-9925; email: bjorgo@isr.gov.au; web: users.bigpond.net.au/gr/acrrcc.html



**Castle Hill Radio Control Off Road Car Club**, Castle Hill 2754; Peter Ellis, 0412 257 353; email: chrcrc@nextcentury.com.au; web: www.2.nextcentury.com.au/chrcrc



**Brisbane Dirt Racing**, Brisbane 4053; Jeff Chandler, 07 3355 7476, 041 8; email: bigfix@bigpond.net.au; web: www.users.bigpond.net.au/bigfix



**The Bayside Raceway**, Brisbane 4178; Nigel Hill, 07 3893 1864; email: mwr1@dingoblu.net.au



**TFTTR - Templestowe Flat Track Racers**, Templestowe 3106; Nigel George, see website; email: tfttr@imagefile.net; web: drive.tfttr.com



**Monaro Radio Control Car Club**, Queanbeyan 2902; Graham Brown, 02 6241 3070; email: gbrown@webone.com.au; web: www.webone.com/~gbrown/mrccc/index.html



**Wee Waa's Offroad RC**, Burren Junction 2386; Shane, 61-02-6796-1339



**NSW Indoor R/C Raceway**, Hurstville 2220; Anthony Lee or Walter Ly, 02-9585-8810



**Victorian Radio Control Drag Racing Association**, Melbourne 3940; John de Tracy, 03 59820459; email: bjrn01@hotmail.com; web: www.ozemail.com.au/~john59/index.html



**Thompson Valley R/C Raceway**, Kamloops V2E 2K7; Brent Wende, (250) 372-2917; email: tvcrc@shaw.ca



**J-T International Raceway**, Nanapene K7R 8A1; N. O'Neill, (613) 354-0099



**Leading Edge R/C Speedway**, Kingston K7M 3Y5; Mike and Tony Daicar, 613-389-4878



**Minatures & Passions**, Ste. Therese J7E 2B4; Gilles Lachance, (450) 979-7989



**Prince George Radio Controlled Car Club**, Prince George V2M 5R9; Doug Waller, 250-561-0035



**Cam R/C**, Coquitlam V3E 1K9; Roger Brown, 604-945-3888



**R/C Champ Raceway**, Scarborough M1H 3A4; Ben, Matthew or Louie, (416) 289-8717; web: www.rcchamp.com



**Recreation R/C Raceway**, Prince George; Doug Waller, (604) 561-0035



**Vancouver R/C Road Racers**, Coquitlam V3E 1K9; Roger Brown, (604) 945-3888



**Steeltown Speedway**, Binbrook L0R 1C0; Trevor Harrison, 905-692-3407 (ask fo; email: the\_prodigy@zdnetbox.com; web: www.geocities.com/s\_speedway



**Sudbury Organized Auto Racing**, Val Caron P3E 1E6; Brad Peacock, 705-897-1435(Brad); email: soarsbury1@hotmail.com; web: www.sudburyrc.no-ip.com



**The All New R.C. World**, Hamilton L0R 1W0; Dave, Larry or Brian, (905) 765-2301 or (9)



**Cactus Speedway**, Kingsville N9Y 2V6; Bob Tanner, 519-326-3176; email: rtanner@wincom.net; web: www.sparcracers.com



**Copetown Raceway**, Copetown; Adam Filipowicz; email: adamfilip@home.com; web: copetownraceway.8k.com



## KEY TO SYMBOLS

Indoor

Outdoor

Off-road

On-road

Oval

Dirt oval

Carpet

Concrete

Asphalt

Minis & Micros

On-site hobby shop

AC power

Auto lap counting

Food available

ATN, Saint-Jean -Baptiste-de-Nicolet J3T 1E5; Louis Durand, (819) 293-6097; email: durand@sogetel.net; web: public.sogetel.net/durand/



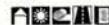
Mid-Canada R/C Auto Racing, Winnipeg R2J 4E6; Boyd Chwartzacki, 204-444-4230; email: midcanadara@mts.net



Kays Hobbies R/C Raceway, Moorefield NOG 2K0; Doug Kay, 519-638-9990; email: dougk@golden.net; web: www.kayshobbies.place.cc



IROCC, Victoria V9B 5W9; Daryl Jones, (250) 478-8013; email: dbjones@shaw.ca



HobbyHobby P.L.R.C., Mississauga L5M 1K8; Tom Bakonyi, 905-858-7978; email: Info@hobbyhobby.com; web: www.hobbyhobby.com



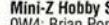
Johns Jump & Grind R/C Track, Waterville BOP 1V0; John Egan, 902-538-8920; email: john.egan@ns.sympatico.ca; web: www.jagrc.com



R/C Fanatic, Charlesbourg G1G 3Y4; Marc Page (Club President), 418-265-2678; email: infos@rcfanatic.com; web: www.rcfanatic.com



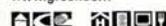
C.A.R.C.A.R., Calgary; Kerry Nevatte, 403-630-8852; web: www.carcar.ca



Mini-Z Hobby Shop, Markham L3R 0W4; Brian Pong, (905)940-0898; email: info@minizhobbyshop.com; web: www.minizhobbyshop.com



Circuit Teleguide ST Roch, ST Roch De L' Michigan J0K 3H0; Gerald Beauchamp, 505-588-4254; email: gedorato@colba.net; web: www.grcrs.com



Circuit J.C., St. Polycarpe J0P 1X0; Jean Castellon, 450-265-3675



## CHILE

OFF/ON ROADERS, Santiago 1; Mauricio Wetter Ferrer, (56)09-8404174; email: mwetter@entelchile.net; web: 38939070.home.icq.com/



Nico Prohens Off/On Roaders, Ovalle 1; Nicolas Prohens, (56) 53-711579; email: nprohens@entelchile.net; web: 38939070.home.icq.com/



## COLOMBIA

Garoso Raceway, Cucuta; Gabriel Rodriguez, 975-751892

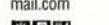


Club De Automodelismo Colombiano, Sanatafe De Bogota D.C.; Jorge Delgado, 1-6130588

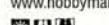


## COSTA RICA

Club de Automodelismo RC10 Costa Rica, San Jose; Osvaldo Averhoff A, (506)2862353; email: nitrocr@hotmail.com



Hobbymania, Hispanidad San Pedro; Randall Jimenez, 506-280-9078; email: hobbymaniestore@hotmail.com; web: www.hobbymanias.com



## CYPRUS

Racing Model Club, Nicosia; Andrea Sotiriou, 913186; fax 493229



## DENMARK

Brondby Motor Club, Brondby 2605; Soren Boy Holst, 45-36-472-462



Holstebro R/C Buggy Club, Holstebro 2600; Michael Brusholt, 45-97-412-734



Klub 144 Raceway, Lyngby 2800; Henrik Carstens, 45-42-88-3691



Rainbow Raceway, Copenhagen 2600; P. Christiansen, 45-52-848-504



Thor Minirace Odense, Odense N° 5240; Ulrich Rasmussen, 45-65-303-707



## DOMINICAN REPUBLIC

Adoca R/C Speedway, Santo Domingo, (809) 220-5266



La Barranquita R/C International Speedway, Santiago, (809) 582-2303



## ENGLAND

Chessington Radio Car Club, Worcester Park; Ian Spiller, 0252-20657



Hampshire Racing Center, Basingstoke; Tony Eudola, 44-1276-61402



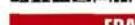
Hinckley RCCC, Hinckley; Bruce, 01455-890580



Worcester Model Car Club, St. John's WR2 609; Mr. Hardy



Netterton Market Model Car Club, Norwich NR16 2JU; Lee Shore, 01760 724857; email: kekezza@ttsmail.net; web: www.wheelspins.co.uk



## FRANCE

Auto Model Club de l'ouest, Lojeret 29470; Peuziat Michel, 98071764



Auto Electron, Limoges 87000; M. Boudoul, 55 062763



Crame Roncq, Mons el Baroeul; Michael Hondekyn, 33-20042755



CSR, Lyon 69009; Pierre-Yves Monfroy, 06 78880852



Lorgies Bolides, Lorgies 62840; Hourdequin Sabine



## GERMANY

Dreykorn Raceway, Lauf 91207; Hermann Hensel, 09123-81457



Mini Car Club Dortmund, Dortmund 4600; Roland Schwan, 0231/213609



MC Kohn, Worringen 50769; Ralf Habel, 02733-477493



Oberhausen-Alstaden, Oberhausen 46099; Josef Holl, 0208-403676



Panik Raceway, Troisdorf 53844; Guido Kraft, 0224-400259

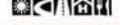


MAC Zweibruecken, Hueffler 66909; Matthew Bailey, 011-49-6384-1388; email: matthew\_w\_bailey@hotmail.com; web: www.geocities.com/matthew\_w\_bailey



## HONDURAS

Autodromo Accion, San Pedro Sula; Colonia Rivera Hernandez; Eduardo Hondal, (504) 52-2061



## HONG KONG

H.K.R.C. Model Car Racing Club, Hong Kong; Alex Chan, (852) 659-2822



Kingsville Buggy Arena, Shatin; Pak Yeung, (852) 607-0828



## INDONESIA

Ancol, Jakarta 14350; Andre Supryana, 62 21 6506040; email: andre@cbn.net.id; web: www.avius.com/ja



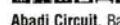
Pondok Cabecircut, JL. Kunir No. 83, Jakarta; Ali Agus Salim, 7403568-9; fax 74915



Karinda Off-Road R/C Car Model Circuit, Jakarta-Selatan 12440; Wivied W. Soedarmadi, 62-21-7900878



Jakarta International Twin Circuit, Dki Jaya; Fayakun Andriadi, 6221-7512439; email: fayakun@soon.com



Abadi Circuit, Bandung 40141; Adi Darmawan, 62-22-2012250; email: darmawaa@bdg.centrin.net.id



## ISRAEL

Nahshoneat, Haifa 32809; Golan Levy, (972) 039386444 or (



IRCCA On-Road Raceway, Rishon LeZion 75650; Shachar Ken-Dror, 972-56-470037; email: dawn@dawn.co.il; web: www.touring-car.up.co.il



## ITALY

AF MODELS RINGS, COLLEGNO 10093; ADRIANO FORATO, +39 335.82.58.434; email: afmodels@mtm.net.it; web: www.afmodels.com



## JAPAN

Kadena R/C Car Club, APO 96367; Ron Nason, 011-81-611-733-1334; email: Ron\_Nason@hotmail.com; web: home.attmii.ne.jp/b/Carmen\_Nason/no.me.htm



Yokota R/C Racers, APO 96326-0034; John Baker, 90-01-81-31175-7-64; email: a4jb@ya.attmii.ne.jp



Xiwakuni R/C Track, FPO AP 96310-0978; David T. Eck, 81-6117-53-3662



## KUWAIT

Inferno DX 4WD Track, Ahadi 61002; Yousef Acqatari



## LEBANON

Wild Willy RCC, Beirut, 00961-4-403751



## MALAYSIA

Acme Speedway, Georgetown, Penang 10000; Moey Chee Cheong, 604-2613175 & 6012-4; email: s\_jamm@hotmail.com



Titiwangsa Raceway, Kuala Lumpur; R.A.C.E. Sdn Bhd., 03-2614496



Jump Square Arena, Selanhor; Thomson Chong, (603) 656-2513



TP Racing R/C Raceway, Selangor; WONG SOO WEI, +603 56388160; email: wong@tp-racing.com



Niko Sales & Service Centre, Johor Bahru; Niko Cheng, (607) 234-3615; email: niko@pd.jaring.my; web: www.niko.com.my

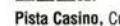


## MEXICO

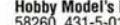
La Hielera, Queretaro 76160; Jorge Morelos Rabell, 42-12-15-25



Tony's Track, Culic-n; Guillermo Prieto, 67-165708-168141



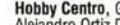
Pista Casino, Cuernavaca 16507; Luis Duhart, 73-19-12-38



Hobby Model's Raceway, Morelid 58260, 431-5-01-22



Hobby's Formula, 01120, 905-502-3620



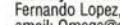
Hobby Centro, Guadalajara 45550; Alejandro Ortiz Del Toro, 36-21-46-28



Jaguar R/C Club, Puebla 72150; Denise or Chiro, 22-31-00-91, 22-33-0



R/C Racing Hobbies, Lopez Mateos Sur 2077; Marcelo Garcia, 33-3121-7185; email: ventas@rcracing.com.mx



Club Kyoso Mexico, Mexico 04330; Fernando Lopez, 52 55 1 56894150; email: Omega@avantel.net; web: www.speedshopmexico.com



Club Dinamo Monterrey, Monterrey 64890; Daniel Ornelas Elizondo, +52 (81) 357458; email: daniel26or@hotmail.com



Nitro Racers, san jose del cabo / los cabos; Franco Meza, (114) 1424422; email: fstmry@hotmail.com



Desstreza Racing Club, Aguascalientes; Luis Lopez, 44 98 961296; email: luis\_lopez@jabil.com



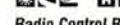
Radio Control Racing San Luis, San Luis Potosi 78280; Higinio Martinez, 011 52 444 817167; email: higinio.martinez4543@hotmail.com



H.F.C.C. Hollandia, The Hague; G. de Jong, 031-070-3679820



M.A.C. Vlymen, Nieuwkuijk; Arjan de Graaf, 31-416-376298



ERCE Eindhoven, Eindhoven 5627In; Henk Fick, 040-2480607; email: info@erceracing.nl; web: www.erceracing.nl

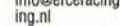


NETHERLANDS

H.F.C.C. Hollandia, The Hague; G. de Jong, 031-070-3679820



M.A.C. Vlymen, Nieuwkuijk; Arjan de Graaf, 31-416-376298



ERCE Eindhoven, Eindhoven 5627In; Henk Fick, 040-2480607; email: info@erceracing.nl; web: www.erceracing.nl



R.C.T.D. Circuit, Dordrecht 3316 GN; Jan van Kooy, 31-78-618-11-84; email: pkrcracing@bit.nl; web: www.pkrcracing.nl



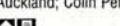
## NEW ZEALAND

Western District R/C Off-Road Car Club, Auckland; Chris, 09-838-5201



## PAPAKUA INDOOR R/C CAR CLUB

Auckland; Colin Perry, 09-298-4711



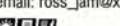
## Harewood Radio Control Car Club

Christ Church; Dean Johnson, 09-388 344



## Counties R/C Raceway

Pukekohe; R. Northcott, 09-23-86904 or 025 9;



## Capitol Model Racers

Lower Hutt; Roger Whitmarsh, 04-566-5714



## NORWAY

Aurskog R/C Club, Aurskog; Tommy Gjeleseth, 47-63-86-21-61



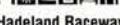
## Dalen Raceway

Molde; Johnny Reitan, 94 64 52 95



## Store-Baller Raceway

3/17/99 61330225; Ola Raastad



## Hadeland Raceway

Gran; Dag Bakke-Nilsen, 61330405



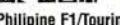
## Lorenskog RC Bane

1475 Finstadjordet; John-Harald Nyemoen, +47 95 88 60 17; email: post@mbk.no; web: www.lmbk.no



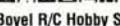
## PHILIPPINES

Philippine R/C Association, Manila; Ronald/Manny Villafior, 23-30-08



## Philipine F1/Touring Club

Quezon City 1156; Raymond Aquilar/Ron Villafior, 896-64-15/23-30-08



## Boyle R/C Hobby Shop

Rizal; Jose Chua, 721-2555



## QRCRR Quezon City Radio Control Car Club

Car Club, Quezon City 1008; Desthy, Emer or William, 0917-8911698; email: emerlitao@quickweb.com.ph; web: www.qrcrr.cjb.net



## PORTUGAL

Aero Clube da Madeira, Madeira, fax 091-221265



Pietersburg Model Racing,  
Pietersburg; Peter Van Vuuren, 0152-  
293-0700

 **R.C. Superbowl**, Elsburg; Karl Fawcett,  
27119076145

 **R.A.C.E. Off Road**, Maraisburg;  
Derrick Plank, 682-2173

 **Rustenburg Off-Roaders**, Rustenburg;  
Jan Van Vollenhoven, 0142-24-846

 **Pretoria Off Road R/C Club**, Pretoria;  
Gert Swart, 012-377-3238

 **Helderberg Radio Control Car Club**,  
Somerset West; Andre Hollander, 024-  
51-2865

 **Banana County R/C Racing Club**,  
Margate 4275; Dennis Steenmans, 27-  
0-391-20975

 **Norkem Raceway Club**, Gauteng; Dan  
de Agrella, 2711-972-7011; email:  
craig@mweb.co.za

 **Grand Prix Electric Car Club**,  
Boksburg; Gary Gibson, 27-11-826-  
1720

 **Pretoria Model Racers**, Pretoria; Deon  
Carf, 27-083-630-2045; web: www.pre-  
toriamrc.co.za

 **Parow Radio Control Car Club**, Parow  
7530; Craig, +27 21 919-5859; email:  
craig@kingsley.co.za; web:  
www.speedmodels.za.org

 **B.R.C.A. Boksburg Radio Car  
Association**; email: recycle@netac-  
tive.co.za; web: www.recycle.co.za

 **MERC Racing**, Rustenburg 0300;  
Gerrie Pretorius, 014-5974569

## SPAIN

 **Outlaw-Ultima II**, Madrid 28016; Juan  
Vacas, 915197298

 **Motoclub Castellon R.C.**, Castellon;  
Octavio Traver, (34) 64 229705, (34)

 **Club Modelismo Catilla**, Burgos  
09080; A.J. Pereda, 34-47-240130

 **A.D. Diablicos**, Zaragoza; Carlos  
Vicente de Vera, 34-76-605350

 **ADAM**, Madrid; Alvaro Sarabia, 01-  
7471113

 **CRAEM**, Madrid; Pablo Llorente, 91-  
3865952

## KEY TO SYMBOLS

 **Indoor**

 **Outdoor**

 **Off-road**

 **On-road**

 **Oval**

 **Dirt oval**

 **Carpet**

 **Club Social Sevillana**, Granada; Oscar  
Saenz, 958-275282

## SWEDEN

 **Amalie Racetrack**, Sollenbrunn 5-  
46632; Tage Johansson

 **PROCAR Speedway**, Veddige 430 20;  
Lars Nordin, 46-0-340-38784; fax;  
email: info@procar.se; web: www.pro-  
car.se

 **Sollenbrunn Miniracing Club**,  
Alingsas; Tage Johansson, 46-322-  
40944; email: tage.j@swipnet.se

 **Staffanstorp Highway 1:8 Track**,  
Staffanstorp 245 45; Brje Petersson,  
46 0 46-256832

 **torvinge raceway**, rappstad 59047  
vikingstad; mats johansson, 013-  
808445; email: mats.j@swipnet.se;  
web: drive.to/mirac

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Radio Control Car Action

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Ridgefield, CT 06877-4606 USA

Track Name

Contact

Country

Address

City

State Zip

Phone no. (required)

email

website

Check all that apply

<input type="checkbox"/> Indoor	<input type="checkbox"/> Dirt	<input type="checkbox"/> On-site hobby shop
<input type="checkbox"/> Outdoor	<input type="checkbox"/> Carpet	<input type="checkbox"/> AC power
<input type="checkbox"/> Off-road	<input type="checkbox"/> Concrete	<input type="checkbox"/> Automatic lap-counting
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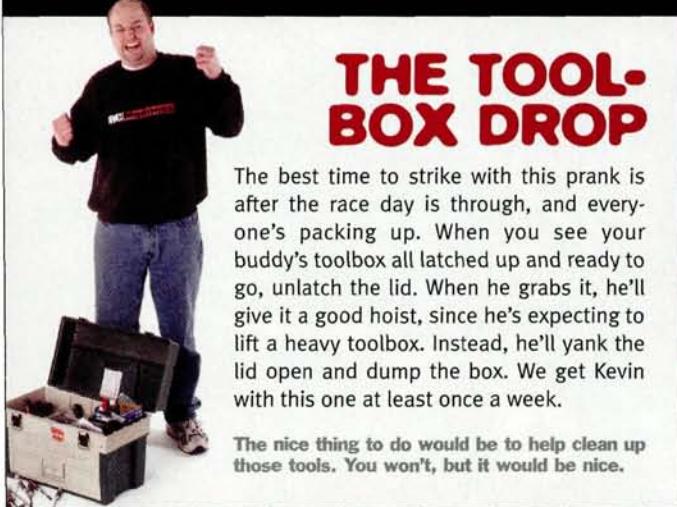
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## PUNK'D RC STYLE

You don't have to be Ashton Kutcher to give someone a good punking; here are our favorite RC gags for proof. Some you'll laugh about with the punkee; others may get you punched out. That's funny for everyone!



### THE TOOL-BOX DROP

The best time to strike with this prank is after the race day is through, and everyone's packing up. When you see your buddy's toolbox all latched up and ready to go, unlatch the lid. When he grabs it, he'll give it a good hoist, since he's expecting to lift a heavy toolbox. Instead, he'll yank the lid open and dump the box. We get Kevin with this one at least once a week.

The nice thing to do would be to help clean up those tools. You won't, but it would be nice.

### THE PHONY NAME

Sign up for your race with one of these goof names, and watch hilarity ensue when the announcer starts calling for you. Thank you Bart Simpson, you are The Master.

Hugh Jass  
Amanda Huggenkiss  
Oliver Closeoff  
Seymour Butz

Jaques Strap  
Mike Rotch  
Heywood U. Cuddlème  
Maya Buttreaks

### THE TOOL-BOX DROP PART 2

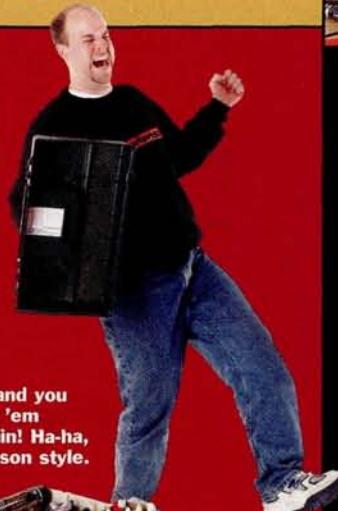
It won't take long for your buddy to get hip to the unlatched-latches trick, but you can still get him. Leave the latches latched, but drive out the pins in the lid's hinges. He'll never see it coming.



... and you got 'em again! Ha-ha, Nelson style.



A slip of the pin ...



### STICKY SNEAKERS

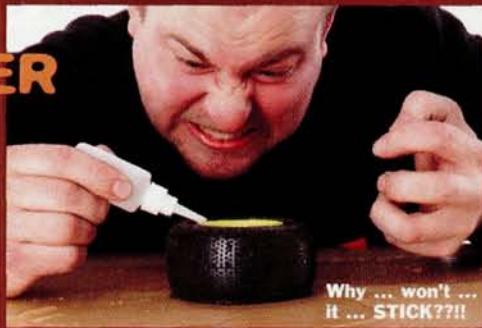
While your mark is on the drivers' stand, sneak around to the back of the stand and run some thin tire glue along the soles of his shoes. If you do it right, he'll pop right out of his Airwalks when he tries to move.

You'll waste an entire bottle of CA on this, but it's worth the \$5.



### WORST GLUE EVER

Just finished off a bottle of tire glue? Don't toss it; fill the bottle with water and slip it into your mark's toolbox. Then watch the fun when it's time to glue up a set of tires.



Sure, he'll get you back later. But for now, enjoy his suffering.



### HEX-DRIVER JUMBLE

If your mark uses hex drivers with replaceable tips, you can really mess with his head. While he's up on the stand or at lunch, swap the metric tips with the standard tips, so none of the tool handles' labels match the tip sizes. Infuriating for him; funny for you.

### STICKER ASSAULT

Some guys leave the body off their car until it's time to race. That's your chance to cover it with Care Bears stickers or some other wack decals. By the time he sees the redecorated body, there won't be enough time for him to pick them off before he has to grid his car. Make sure that you point out his lame car to the crowd during the race! ■

Oops, it backfired. Kev likes it!

